



Repair Manual Golf Variant 2010 ➤

Suspension, Wheels, Steering

Edition 09.2022





List of Workshop Manual Repair Groups

Repair Group

- 00 - General, Technical Data
- 40 - Front Suspension
- 42 - Rear Suspension
- 44 - Wheels, Tires, Wheel Alignment
- 48 - Steering



Technical information should always be available to the foremen and mechanics, because their careful and constant adherence to the instructions is essential to ensure vehicle road-worthiness and safety. In addition, the normal basic safety precautions for working on motor vehicles must, as a matter of course, be observed.

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00 – General, Technical Data

1 Check List, Assessing the Suspension on Vehicles Involved in a Collision

(Edition 09.2022)

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When servicing load-bearing or wheel-supporting components on vehicles involved in a collision, damages on the suspension could remain undiscovered. These undiscovered damages may lead to severe damage in continued vehicle operation. Therefore, on vehicles involved in a collision, the listed components must be checked in the described manner and sequence and done independently from the vehicle alignment to be performed. If no deviations from the specified values were determined during the wheel alignment, then there are no deformations on the suspension.

Visual inspection and function check of the steering system

- ◆ Visual inspection for deformations and cracks
- ◆ Check for play in tie rod joints and steering gear
- ◆ Visual inspection for faulty bellows and grease boots
- ◆ Check electric and hydraulic lines and hoses for chafe marks, cuts and kinks.
- ◆ Check hydraulic lines, threaded connections and steering gear for leaks
- ◆ Make sure the steering gear and lines are securely fastened.
- ◆ Check for correct function over the entire steering angle by turning the steering wheel from stop to stop. Steering wheel must be able to rotate an even force without getting caught.

Visual and Function Test for the Suspension

- The sequence of the following test steps must be maintained.
- ◆ Check all components shown in the overviews for deformation, cracks and other damage.
- ◆ Replace the damaged components
- ◆ Perform a vehicle alignment on a Volkswagen AG approved alignment rack.

Visual and function test for wheels, tires

- ◆ Check for run-out and imbalance. Refer to [⇒ V12 iibration, Causes and Solution](#), page 361 .
- ◆ Check tires for cuts and impact damage in the tread and on the sidewalls. Refer to [⇒ V12 iibration, Causes and Solution](#), page 361 .
- ◆ Check the tire pressure; see the tire pressure label in the fuel filler door for the inflation pressure.

Replace the tire if the rim and/or the tire are damaged. This also applies when the crash details and damage to the vehicle point to possible non-visible damages.

Another deciding factor is the age of the tires: the tires must not be older than 6 years.



If in doubt:

- As soon as a safety risk cannot be ruled out, the tire(s) must be replaced.

Entire vehicle

Also check other vehicle systems, for example:

- ◆ Brake system including ABS
- ◆ Exhaust system and passenger protection by visual and function check

Test values, adjustment values and notes can be found in respective repair manuals/ELSA.

This test is for checking the chassis on a vehicle, that has been in a collision. The test does not cover the entire vehicle.

Electronic vehicle systems

Safety-related systems, such as ABS/EDS; airbags; electronically-controlled suspension systems; electro-mechanical; electro-hydraulic steering and other driver assist systems, must be checked for any error messages using the ⇒ Vehicle diagnostic tester. If faults were stored in the DTC memory for the system mentioned, then these systems must be serviced according to the specifications in the repair manual/ELSA. After performing repairs, check the DTC memory of the affected system again, to make sure that proper function can be ensured again.





2 General Information

Information on wheels, tires and snow chains can be found in the "Wheel and Tire Guide". Refer to ⇒ **Wheel and Tire Guide; Rep. Gr. 44.**





40 – Front Suspension

1 Vehicles Involved in Collisions, Evaluating

For a check list for assessing the suspension on vehicles involved in a collision, Refer to [⇒ L1 ist, Assessing the Suspension on Vehicles Involved in a Collision](#), page 1 .





2 Front Suspension, Servicing

⇒ [-2.1 Front Axle", page 5](#)

⇒ [B2.2 earing, Lifting to Curb Weight Position", page 6](#)

2.1 Overview - Front Axle



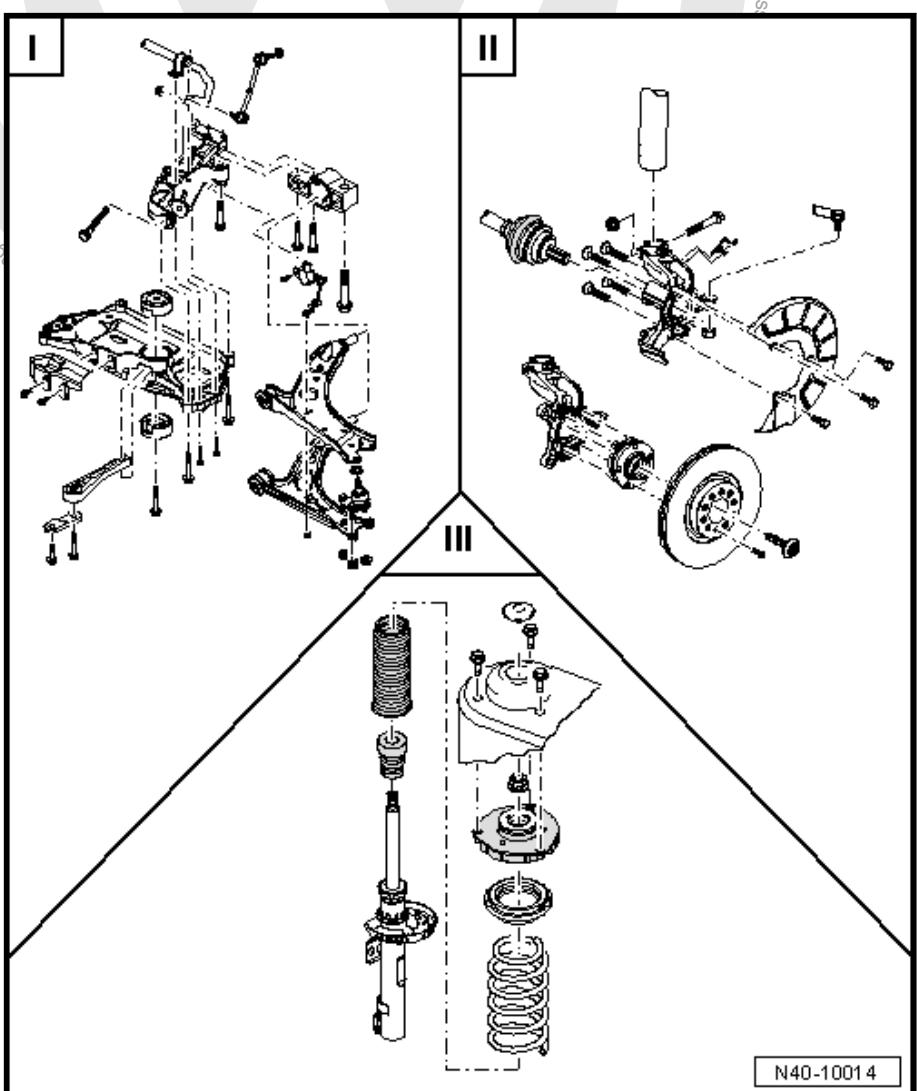
Note

- ◆ Welding and alignment work on supporting and wheel carrying suspension components is not permitted.
- ◆ Always replace self-locking nuts.
- ◆ Always replace corroded bolts/nuts.
- ◆ Bonded rubber bushings have a limited range of rotation. Therefore, only tighten bolts on components with bonded rubber bushings when wheel bearing housing is lifted (curb weight position). Refer to ⇒ [B2.2 earing, Lifting to Curb Weight Position", page 6](#).

I - Overview - Subframe, Stabilizer Bar and Control Arms.
 Refer to ⇒ [-3.1 Subframe, Stabilizer Bar and Control Arms", page 9](#).

II - Overview - Wheel Bearing.
 Refer to ⇒ [-4 Wheel Bearing", page 70](#).

III - Overview - Suspension Strut. Refer to ⇒ [-5 Suspension Strut", page 82](#).



N40-10014

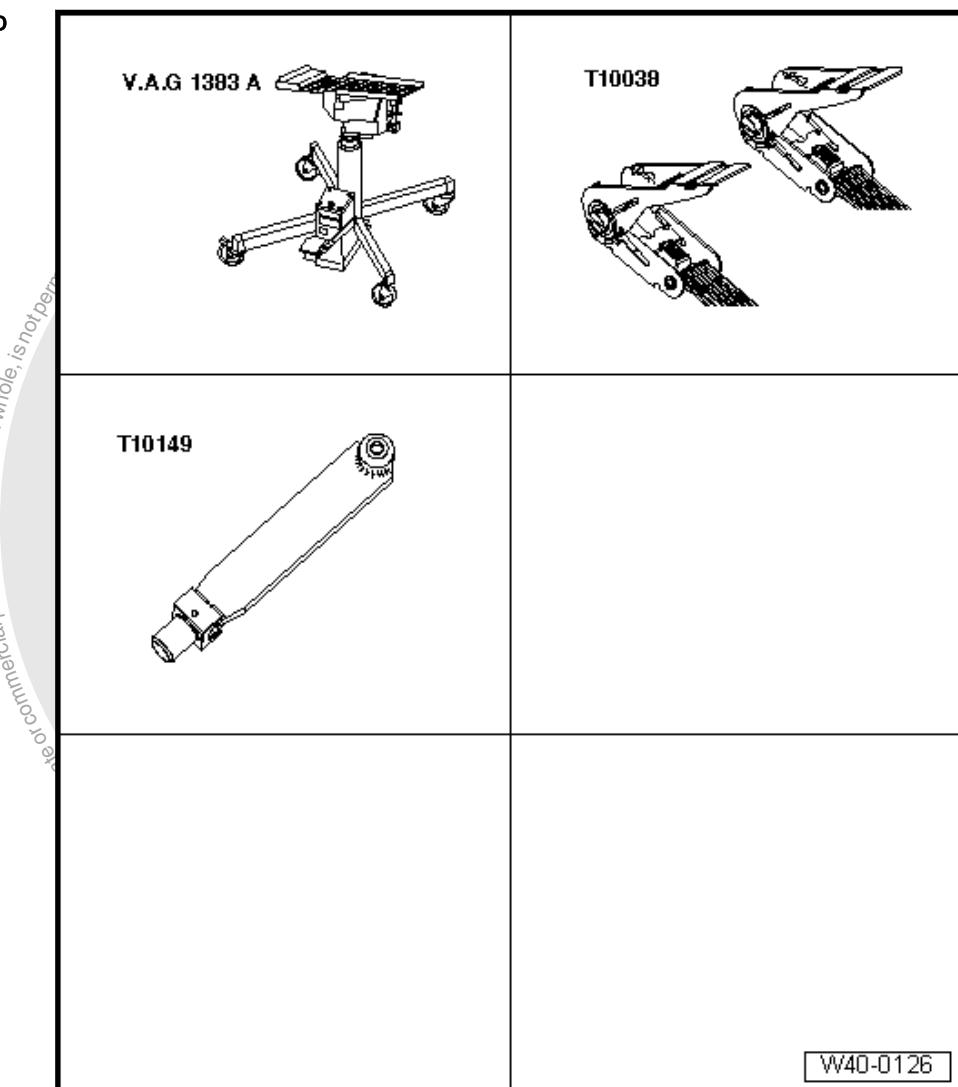


Refer to [⇒ A6.3 xle with CV Joint, Removing and Installing](#),
[page 98](#) for the "Drive Axles, Removing and Installing" chapter.

Refer to [⇒ A7 xles, Overview and Servicing](#), [page 105](#) for the
"Drive Axles, Servicing" chapter.

2.2 Wheel Bearing, Lifting to Curb Weight Position

Special tools and workshop equipment required



W40-0126

- ◆ Engine and Gearbox Jack -VAS 6931-
- ◆ Tensioning Strap -T10038-
- ◆ Engine/Gearbox Jack Adapter - Wheel Hub Support -
T10149-



Caution

All bolts on suspension components with bonded rubber bushings must always be tightened in curb weight position (unloaded condition).

Bonded rubber bushings have a limited range of rotation.

Axle components with bonded rubber bushings must be brought into the position they will be in when driving before they are tightened (curb weight position).

Otherwise, the bonded rubber bushing will have tension, which will reduce the service life.

By raising the suspension using the Engine and Gearbox Jack -VAS 6931- and Engine/Gearbox Jack Adapter - Wheel Hub Support -T10149-, this position can be simulated on the hoist.

Before the applicable suspension is raised, the vehicle must be secured to the hoist lifting arms using Tensioning Straps -T10038-.

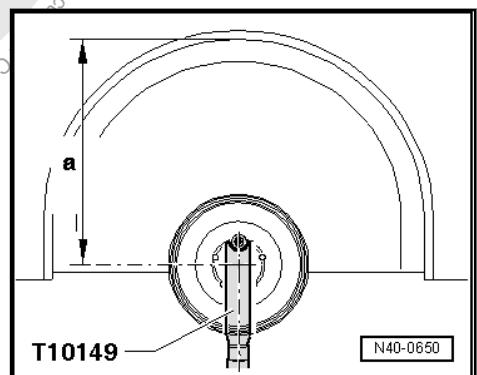


WARNING

There is a risk that the vehicle could fall off the hoist if it is not secured.

- Turn the wheel hub until one of the holes for the wheel bolts is on top.
- Install the Engine/Gearbox Jack Adapter - Wheel Hub Support -T10149- with a wheel bolt on the wheel hub.

The applicable bolts/nuts must only be tightened when dimension -a- between the center of the wheel hub and the lower edge of the wheel housing has been reached.



The dimension -a- is dependent on the height of the installed suspension:

Chassis 1)	Height -a- in mm
Basic suspension (2UA)	382 ± 10 mm
Heavy duty suspension (2UB)	402 ± 10 mm
Sport suspension except 18" wheels (2UC)	367 ± 10 mm
Sport suspension with 18" wheels (G02/G05/G07/2UC)	367 ± 10 mm



Suspension, USA and Canada 1)	Height -a- in mm
Basic suspension (2UA)	382 ± 10 mm
Sport suspension (2UC)	382 ± 10 mm

Suspension, Mexico 1)	Height -a- in mm
Base suspension (2UD)	393 ± 10 mm

1) The type of vehicle suspension is indicated on the vehicle data label. The suspension is indicated by a PR number. To determine which PR number represents which suspension, Refer to [⇒ D8.11 ata Label](#), page 353 .

- Lift the wheel bearing housing using the Engine and Gearbox Jack -VAS 6931- until dimension -a- is reached.



WARNING

- ◆ *Do not lift or lower the vehicle when the engine and gearbox jack is under the vehicle.*
- ◆ *Do not leave the Engine and Gearbox Jack -VAS 6931- under the vehicle any longer than necessary.*

- Tighten the applicable bolts and nuts.
- Lower the wheel bearing housing.
- Remove the Engine and Gearbox Jack -VAS 6931- from under the vehicle.
- Remove the Engine/Gearbox Jack Adapter - Wheel Hub Support -T10149-.



3 Subframe, Stabilizer Bar and Control Arms

- ⇒ [-3.1 Subframe, Stabilizer Bar and Control Arms", page 9](#)
- ⇒ [-3.2 Left Front Level Control System SensorG78 ", page 13](#)
- ⇒ [L3.3 eft Front Level Control System SensorG78, Removing and Installing", page 14](#)
- ⇒ [i3.4 n Longitudinal Member, Servicing", page 15](#)
- ⇒ [a3.5 nd Brackets, Securing", page 16](#)
- ⇒ [L3.6 owing", page 18](#)
- ⇒ [w3.7 ithout Steering Gear, Removing and Installing", page 22](#)
- ⇒ [w3.8 ith Steering Gear, Removing and Installing", page 27](#)
- ⇒ [S3.9 ervicing", page 33](#)
- ⇒ [J3.10 oint, Checking", page 43](#)
- ⇒ [J3.11 oint, Removing and Installing", page 44](#)
- ⇒ [A3.12 rm with Mounting Bracket, Removing and Installing", page 48](#)
- ⇒ [A3.13 rm with Mounting Bracket, Removing and Installing, Left Side for Vehicles with DSG or Automatic Transmission", page 52](#)
- ⇒ [A3.14 rm Bonded Rubber Bushing, Replacing", page 58](#)
- ⇒ [B3.15 racket with Control Arm Bearing, Replacing", page 61](#)
- ⇒ [B3.16 ar, Removing and Installing", page 63](#)

3.1 Overview - Subframe, Stabilizer Bar and Control Arms



Caution

- ◆ *Welding and alignment work on suspension components that are supporting or control the wheels is not permitted.*
- ◆ *Always replace self-locking nuts.*
- ◆ *Always replace corroded bolts/nuts.*



1 - Nut

- 65 Nm
- When tightening, counterhold at the joint pin inner hex socket.
- Self-locking
- Always replace if removed

2 - Coupling Rod

- Stabilizer bar connection to the suspension strut

3 - Bracket

- Securing. Refer to [Fig. "Bracket, Securing"](#), page 17 .
- If a bracket is replaced, the vehicle must be aligned. Refer to [A8 alignment](#), page 340 .

4 - Mounting Bracket

- Securing. Refer to [Fig. "Mounting Bracket, Securing"](#), page 17 .
- With bonded rubber bushing

5 - Bolt

- 50 Nm + 90° additional turn
- Always replace if removed

6 - Bolt

- 70 Nm + 90° additional turn
- Always replace if removed

7 - Bolt

- 70 Nm + 90° additional turn
- Always replace if removed

8 - Left Front Level Control System Sensor-G78-

- Removing and Installing. Refer to [L3.3 Left Front Level Control System Sensor G78, Removing and Installing](#), page 14 .
- Can be checked in Guided Fault Finding using the [Vehicle diagnostic tester](#).

9 - Bolt

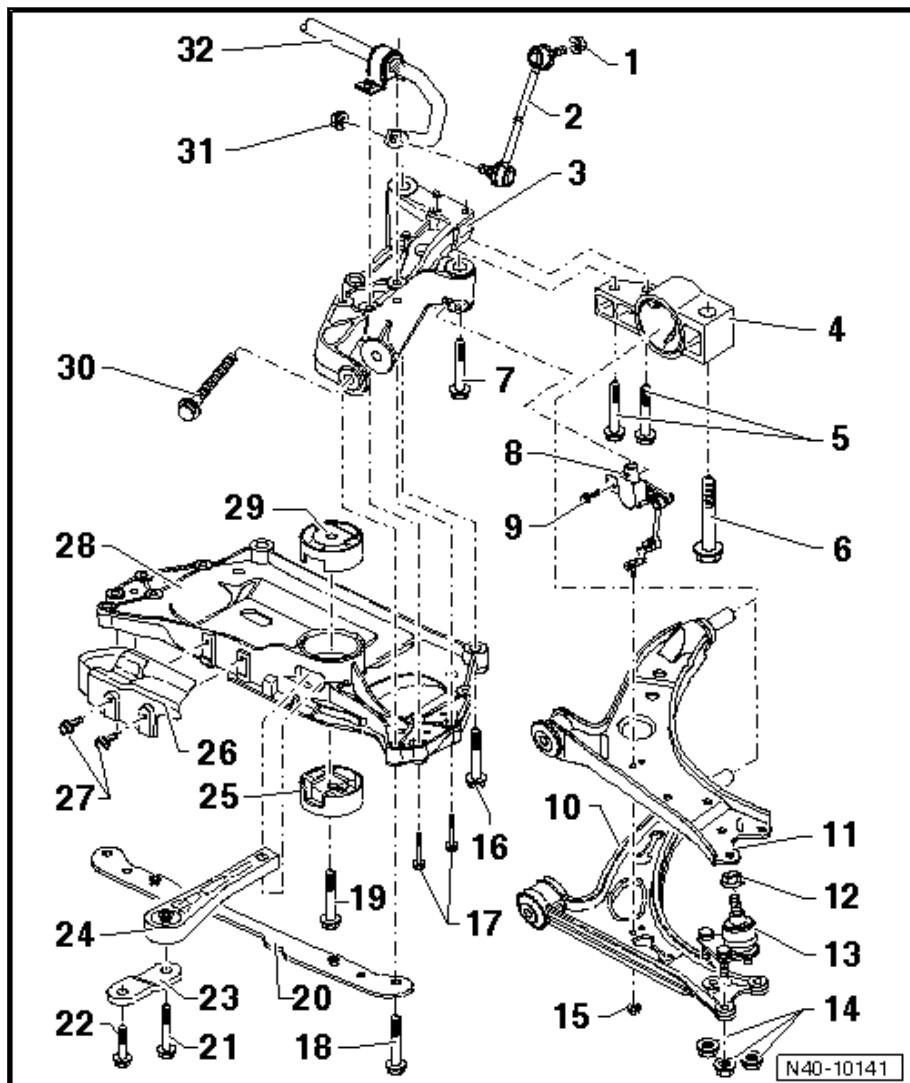
- 9 Nm

10 - Control Arm

- There may be different versions of the control arms (cast steel, aluminum)
- Allocation. Refer to the [Electronic Parts Catalog \(ETKA\)](#).



Note



Select to the correctness of information in this document.



Installing control arms made of different materials on the right and left side is not permitted.

- Replace with the ball joint if damaged.
- Removing and Installing. Refer to [⇒ A3.12 rm with Mounting Bracket, Removing and Installing”, page 48](#).
- Bearing, Replacing. Refer to [⇒ A3.14 rm Bonded Rubber Bushing, Replacing”, page 58](#)

11 - Control Arm

- There may be different versions of the control arms (welded steel panel, single-piece steel panel)
- Allocation. Refer to the ⇒ Electronic Parts Catalog (ETKA).



Note

A mixed installation of welded steel panel control arms and single-piece steel panel control arms on the right and left side is permitted.

- Replace with the ball joint if damaged.
- Removing and Installing. Refer to [⇒ A3.12 rm with Mounting Bracket, Removing and Installing”, page 48](#).
- Bearing, Replacing. Refer to [⇒ A3.14 rm Bonded Rubber Bushing, Replacing”, page 58](#)

12 - Nut

- 60 Nm
- Self-locking
- Always replace if removed

13 - Ball Joint

- Check using the Vehicle Diagnostic Tester Refer to [⇒ J3.10 oint, Checking”, page 43](#).
- Removing and Installing. Refer to [⇒ J3.11 oint, Removing and Installing”, page 44](#).
- If damaged, replace with the control arm.

14 - Nut

- For cast-steel control arms: 60 Nm
- For steel and aluminum control arms: 100 Nm
- Self-locking
- Always replace if removed

15 - Nut

- 9 Nm
- Self-locking
- Always replace if removed

16 - Bolt

- Different versions
- Allocation. Refer to the ⇒ Electronic Parts Catalog (ETKA).
- M12 x 1.5 x 100 - 70 Nm + 90° additional turn
- M12 x 1.5 x 110 - 70 Nm
- Always replace if removed

17 - Bolt

- 20 Nm + 90° additional turn
- Always replace if removed

18 - Bolt

- 70 Nm + 90° additional turn



- Always replace if removed

19 - Bolt

- 100 Nm + 90° additional turn
- Only tighten when pendulum support is bolted to transmission
- Always replace if removed

20 - Impact Guard Bracket

- Allocation. Refer to the ⇒ Electronic Parts Catalog (ETKA).

21 - Bolt

- 50 Nm + 90° additional turn
- Always replace if removed

22 - Bolt

- 50 Nm + 90° additional turn
- Always replace if removed

23 - Bracket to Pendulum Support

- Not a separate part

24 - Pendulum Support

- Bolt first to the transmission, then to subframe
- Different versions
- Allocation. Refer to the ⇒ Electronic Parts Catalog (ETKA).

25 - Lower Bonded Rubber Bushing for Pendulum Support

- Removing and installing. Refer to ⇒ [S3.9 Servicing](#), page 33.
- There are different versions. Refer to ⇒ [Fig. "Identifying the pendulum support bonded rubber bushings"](#), page 13.
- Allocation. Refer to the ⇒ Electronic Parts Catalog (ETKA).

26 - Shield

- For FWD vehicles only

27 - Bolt

- 6 Nm
- Self-tapping

28 - Subframe

- Different versions
- Removing and Installing, without Steering Gear. Refer to ⇒ [w3.7 without Steering Gear, Removing and Installing](#), page 22.
- Removing and Installing, with Steering Gear. Refer to ⇒ [w3.8 with Steering Gear, Removing and Installing](#), page 27.
- Allocation. Refer to the ⇒ Electronic Parts Catalog (ETKA).

29 - Upper Bonded Rubber Bushing for Pendulum Support

- Removing and installing. Refer to ⇒ [S3.9 Servicing](#), page 33.
- There are different versions. Refer to ⇒ [Fig. "Identifying the pendulum support bonded rubber bushings"](#), page 13.
- Allocation. Refer to the ⇒ Electronic Parts Catalog (ETKA).

30 - Bolt

- 70 Nm + 180° additional turn
- Always replace if removed
- Always tighten the threaded connections in curb weight position. Refer to ⇒ [B2.2 Lifting, Lifting to Curb Weight Position](#), page 6.

31 - Nut

- 65 Nm
- When tightening, counterhold at the joint pin inner hex socket.

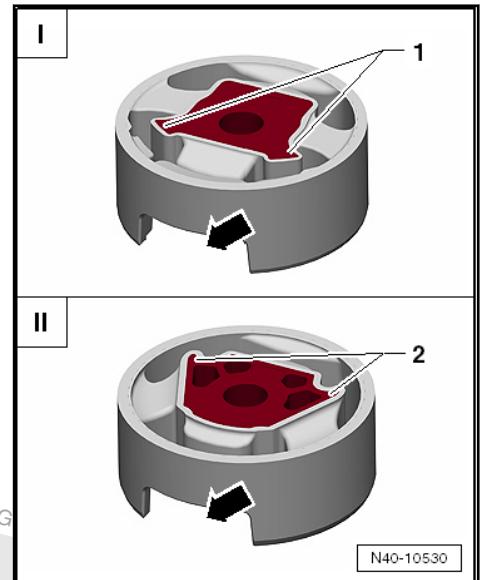


- Self-locking
- Always replace if removed

32 - Stabilizer Bar

- Different versions
- Allocation. Refer to the ⇒ Electronic Parts Catalog (ETKA).
- Removing and Installing. Refer to ⇒ B3.16 ar, *Removing and Installing*, page 63 .

Identifying the pendulum support bonded rubber bushings



Note

- ◆ There are two different versions of the pendulum support bonded rubber bushing: the T version -I- and the V version -II-.
- ◆ Refer to the ⇒ Electronic Parts Catalog (ETKA) for the allocation.

I - The corners on the inner core -1- face toward the opening for the pendulum support -arrow- (T version).

II - The corners on the inner core -2- face away from the opening for the pendulum support -arrow- (V version).

3.2 Overview - Left Front Level Control System Sensor -G78-



Note

- ◆ A replacement Left Front Level Control System Sensor -G78- comes only complete with the coupling rod and the upper and lower retaining plate.
- ◆ Replacing with the subframe installed.



1 - Subframe

2 - Bolt

- M6 x 16
- 9 Nm

3 - Left Front Level Control System Sensor -G78- and Right Front Level Control Sensor -G289-

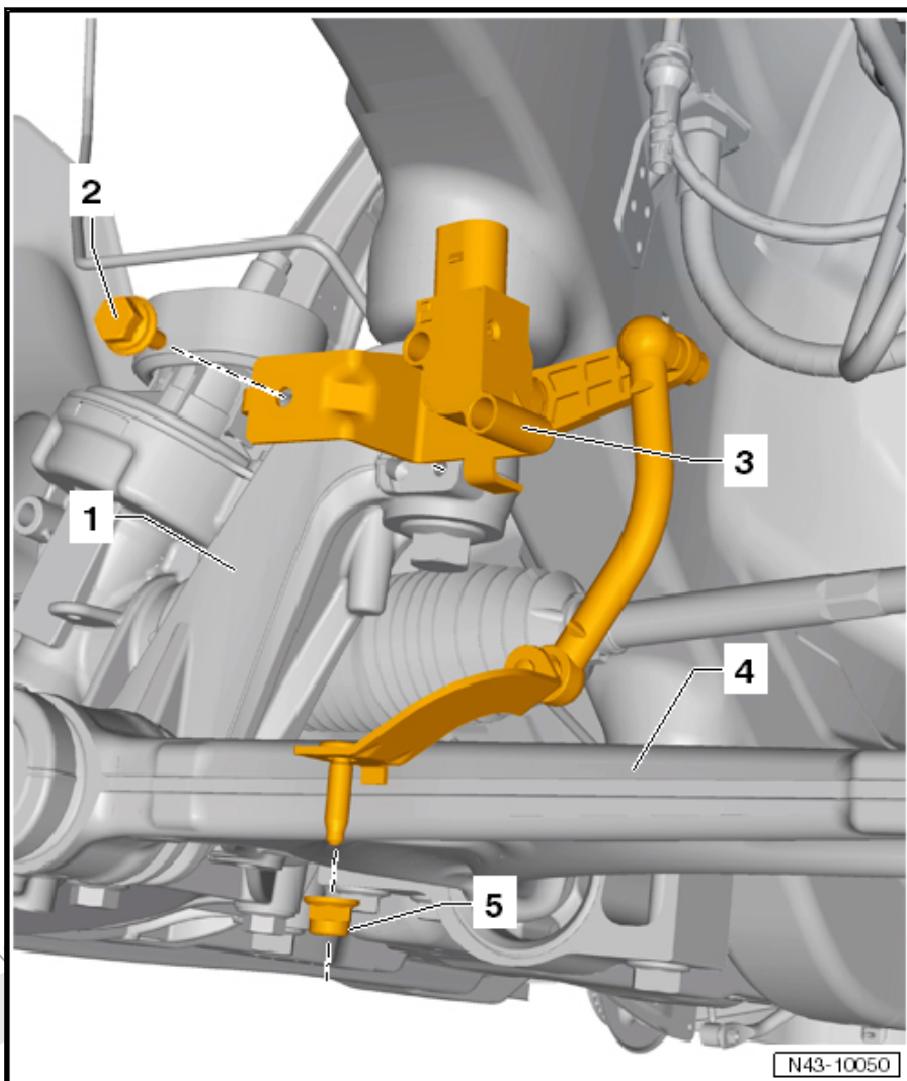
- Complete with attachments
- The lever -arrow- must point toward the vehicle exterior
- Removing and Installing. Refer to ⇒ [L3.3 eft Front Level Control System Sensor G78, Removing and Installing](#), page 14 .
- After replacing, perform a basic setting for the headlamps

Headlamps basic setting. Refer to ⇒ Vehicle Diagnostic Tester in "Guided Fault Finding" function.

4 - Control Arm

5 - Nut

- 9 Nm
- Self-locking
- Always replace if removed

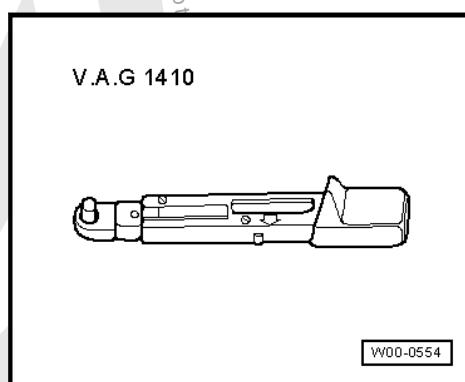


N43-10050

3.3 Left Front Level Control System Sensor -G78-, Removing and Installing

Special tools and workshop equipment required

- ◆ Torque Wrench -V.A.G 1410-



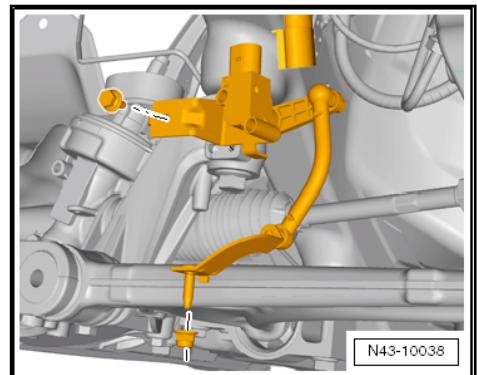


Removing



In order to be able to remove the Left Front Level Control System Sensor -G78- the steering wheel must be turned all the way to the right; this assures that there is enough clearance between the control arm and the stabilizer bar.

- Disconnect the connector.



- Remove the bolt and the nut.
- Remove the level control system sensor.

Installing

Install in reverse order of removal. Note the following:



- ◆ *The level control system sensor lever must point toward vehicle exterior.*
- ◆ *The thread on the vehicle level sensor must be installed into the front hole in the control arm. The tab on the vehicle level sensor bracket must lock into the rear hole in order to assure the correct installation position.*
- Perform a basic setting on the headlamps. Refer to ⇒ Vehicle Diagnostic Tester in "Guided Fault Finding" Function

Tightening Specifications

Component	Tightening Specification
Bolt to subframe	9 Nm
Nut ◆ Use a new nut	9 Nm

3.4 Thread in Longitudinal Member, Servicing

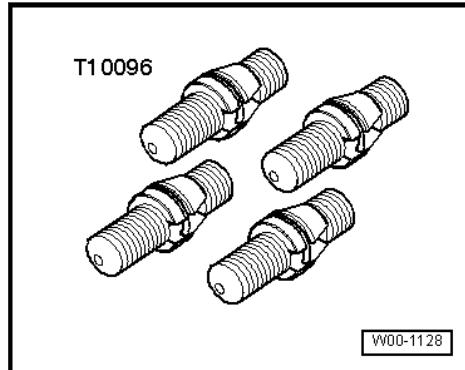
Servicing the weld nut threads in the longitudinal member is possible under certain conditions. Refer to ⇒ Body Repair; Rep. Gr. 50.



3.5 Subframe and Brackets, Securing

Special tools and workshop equipment required

- ◆ Locating Pins -T10096-

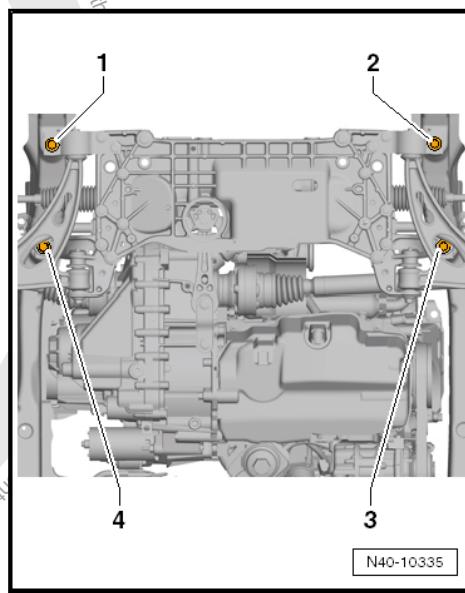


- ◆ Engine and Gearbox Jack -VAS 6931-



Locating Pins -T10096-, Installing

To attach the subframe to the brackets, the Locating Pins - T10096- must be installed in positions: -1-, -2-, -3- and -4- one after the other.



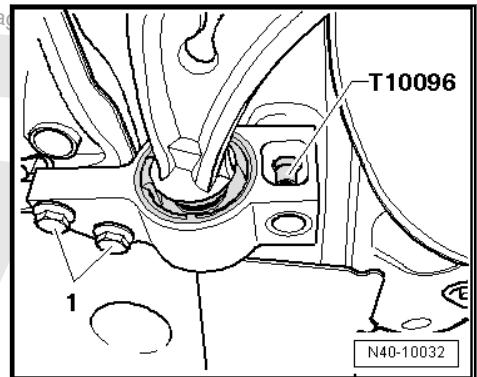


Note

Locating Pins -T10096- may only be tightened to a maximum of 20 Nm, otherwise the threads on the locating pins will be damaged.

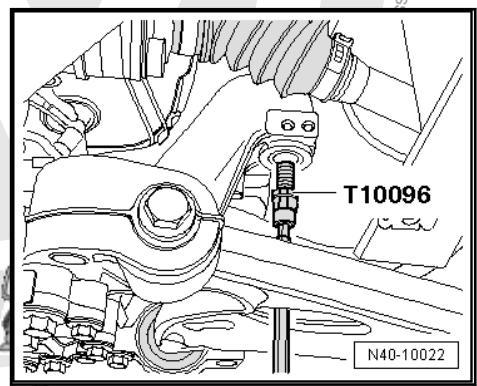
- Replace the bolts on the mounting bracket consecutively on both sides with the Locating Pins -T10096- and tighten to 20 Nm.

Mounting Bracket, Securing



- Replace the bracket bolts consecutively with Locating Pins -T10096- and tighten to 20 Nm.

Bracket, Securing



The position of front axle is now secured.

Continue with removing the subframe without steering gear.
Refer to [⇒ page 24](#).

Continue with removing the subframe with steering gear. Refer to [⇒ page 31](#).

Continue with removing the stabilizer bar. Refer to [⇒ page 66](#).

Continue with removing and installing the steering gear on LHD vehicles. Refer to [⇒ page 421](#).

Locating Pins -T10096-, Removing

Removal is performed in the reverse order of installation. Make sure that the Locating Pins -T10096- are replaced one after the other with new bolts.



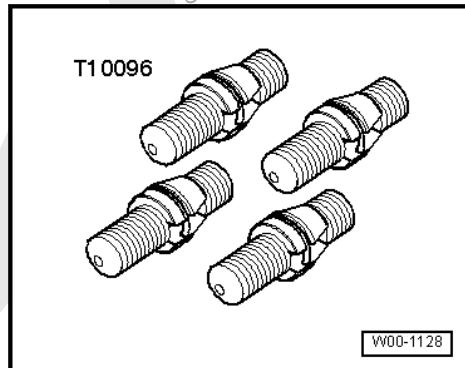
Tightening Specifications

Component	Tightening Specification
Subframe to body ◆ Different versions ◆ Allocation. Refer to the ⇒ Electronic Parts Catalog (ETKA). ◆ Use new bolts.	◆ M12 x 1.5 x 100: 70 Nm + 90° ◆ M12 x 1.5 x 110: 70 Nm
Bracket to body ◆ Use new bolts.	70 Nm + 90°
Mounting bracket to body ◆ Use new bolts.	70 Nm + 90°

3.6 Subframe, Lowering

Special tools and workshop equipment required

- ◆ Locating Pins -T10096-



- ◆ Engine and Gearbox Jack -VAS 6931-



Removing

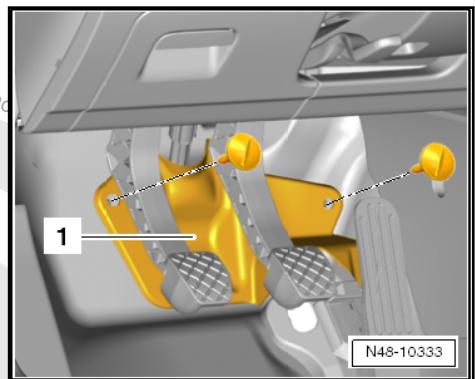
- Turn the steering wheel in the straight position and remove the ignition key so that the steering wheel lock engages.

Vehicles with "Keyless Access" keyless locking and starting system

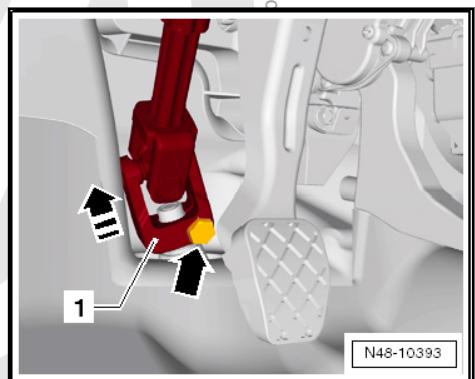
- Switch the ignition off and open the driver door so the steering wheel lock engages.

Continuation for all vehicles

- Remove the footwell trim panel -1-.



- Remove the bolt -arrow- from the universal joint -1-, and then remove the universal joint in the -direction of the arrow-.



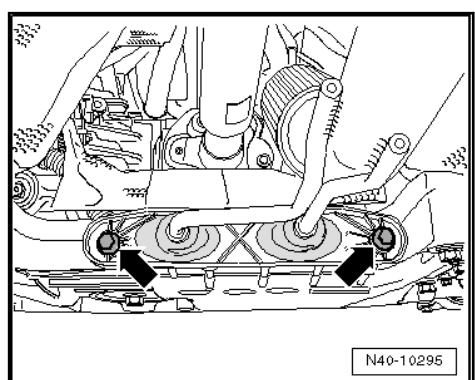
Caution

If the universal joint is separated from the steering gear, the following work cannot be performed:

- ◆ Switching on the ignition
- ◆ Turning the steering gear
- ◆ Turning the steering column.

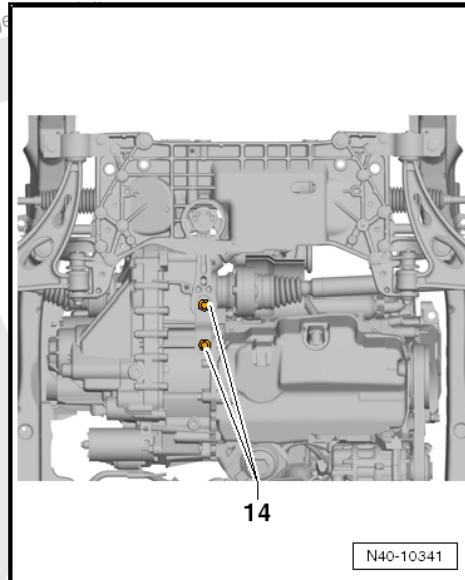
These points must be observed since performing these actions could cause irreparable damage.

- Remove the lower noise insulation. Refer to ⇒ Body Exterior; Rep. Gr. 50; Overview - Noise Insulation.
- Remove the exhaust system bracket from the subframe -arrows-.

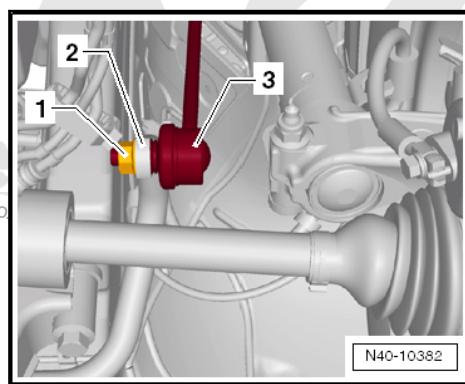




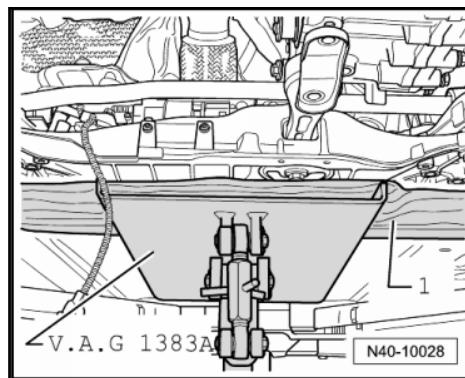
- Remove the bolts -14- and then remove the pendulum support from the transmission.



- Remove the hex nut -1- from the right and left coupling rod -3-.



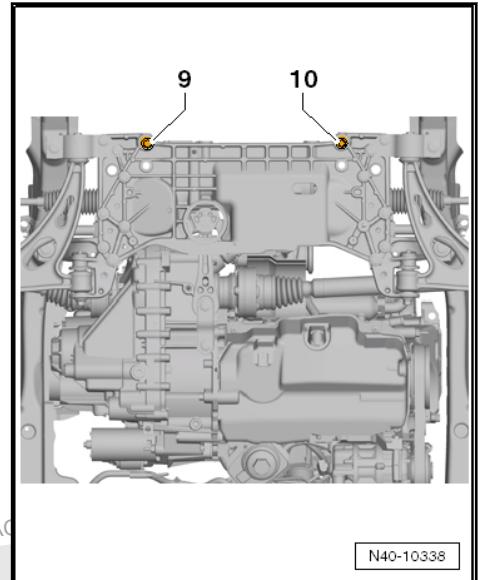
- Remove the coupling rod -3- from the stabilizer bar -2- on the left and right sides.
- Secure the subframe. Refer to [a3.5 nd Brackets, Securing](#), page 16 .
- Place the Engine and Gearbox Jack -VAS 6931- under the subframe.



- Place a block of wood -1-, for example, between the Engine and Gearbox Jack -VAS 6931- and the subframe.



- Remove the bolts -9- and -10- and lower the subframe a maximum of 10 cm.



N40-10338

Note

Be careful not to overstretch the wire for the steering.

Installing

Install in reverse order of removal.

- Install the lower noise insulation. Refer to ⇒ Body Exterior; Rep. Gr. 50; Overview - Noise Insulation.

Note

Make sure the ball joint boot is not damaged or twisted.

Tightening Specifications

Component	Tightening Specification
Subframe to body <ul style="list-style-type: none"> Different versions Allocation. Refer to the ⇒ Electronic Parts Catalog (ETKA). Use new bolts. 	<ul style="list-style-type: none"> M12 x 1.5 x 100: 70 Nm + 90° M12 x 1.5 x 110: 70 Nm
Bracket to body <ul style="list-style-type: none"> Use new bolts. 	70 Nm + 90°
Mounting bracket to body <ul style="list-style-type: none"> Use new bolts. 	70 Nm + 90°
Stabilizer bar to coupling rod <ul style="list-style-type: none"> Use a new nut Counterhold at joint pin inner multi-point fitting 	65 Nm
Universal joint to steering gear <ul style="list-style-type: none"> Use a new bolt 	30 Nm



Component	Tightening Specification
Exhaust system bracket to subframe. Refer to ⇒ Engine Mechanical, Fuel Injection and Ignition; Rep. Gr. 26.	

Tightening specification, pendulum support to the transmission

Bolt	Tightening Specification
M10 x 35 ◆ Use a new bolt	50 Nm + 90° additional turn
M10 x 75 ◆ Use a new bolt	50 Nm + 90° additional turn

3.7 Subframe without Steering Gear, Removing and Installing

Special tools and workshop equipment required

- ◆ Torque Wrench, 6-50Nm -VAG 1331A-



- ◆ Torque Wrench, 40-200Nm -V.A.G 1332A-

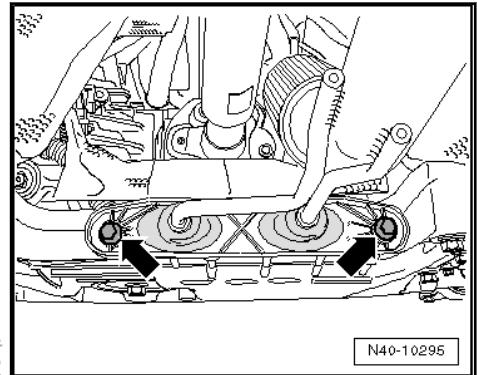


Removing

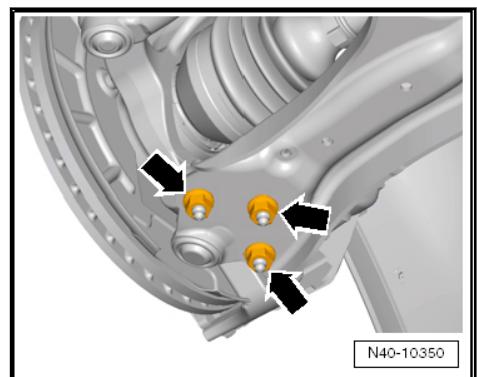
- Remove the lower noise insulation. Refer to ⇒ Body Exterior; Rep. Gr. 50; Overview - Noise Insulation.
- Remove the wheels.
- Remove the exhaust system bracket from the subframe -arrows-.



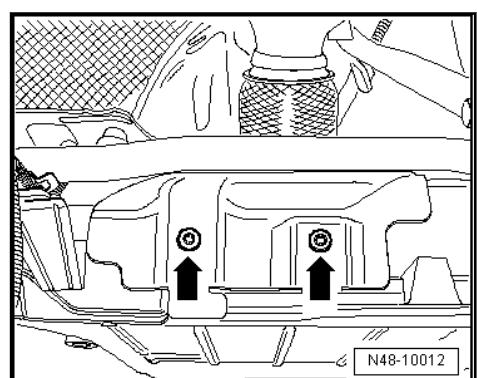
- Remove the nuts -arrows- on the left and right side of the vehicle.

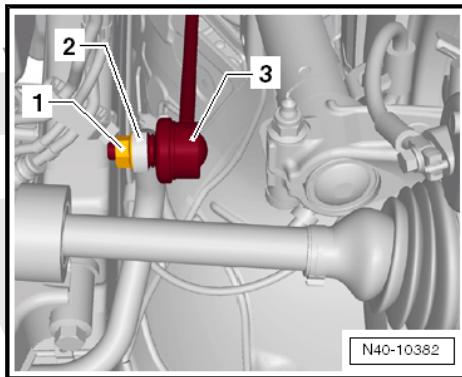


- Remove the control arm from the ball joint.
- If equipped, remove the heat shield bolts -arrows-.

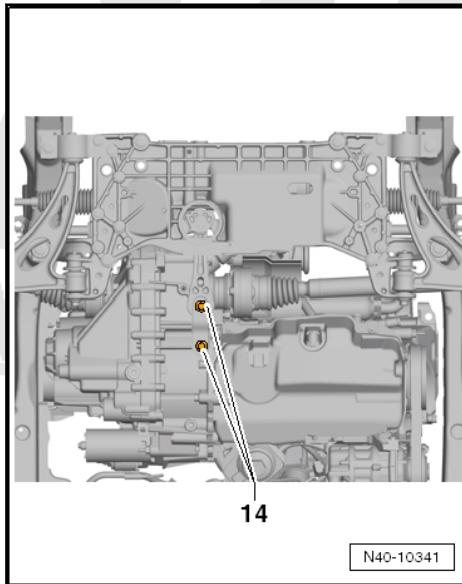


- If equipped, remove the subframe heat shield.
- Remove the hex nut -1- from the right and left coupling rod -3-.





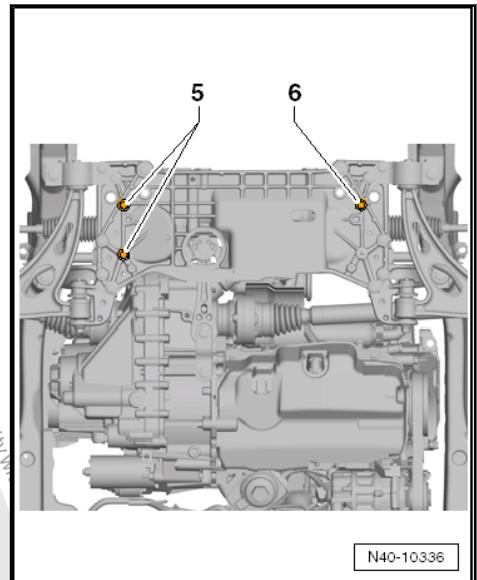
- Remove the coupling rod -3- from the stabilizer bar -2- on the left and right sides.
- Remove the bolts -14- and then remove the pendulum support from the transmission.



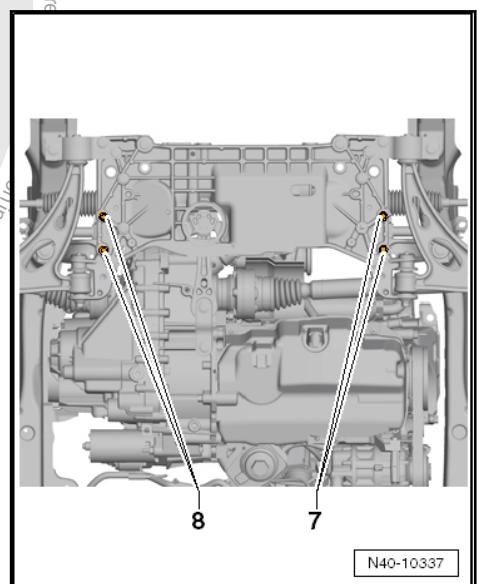
- Secure the subframe. Refer to [⇒ a3.5 nd Brackets, Securing](#), page 16 .
- Remove the steering gear bolts -5- and -6-.

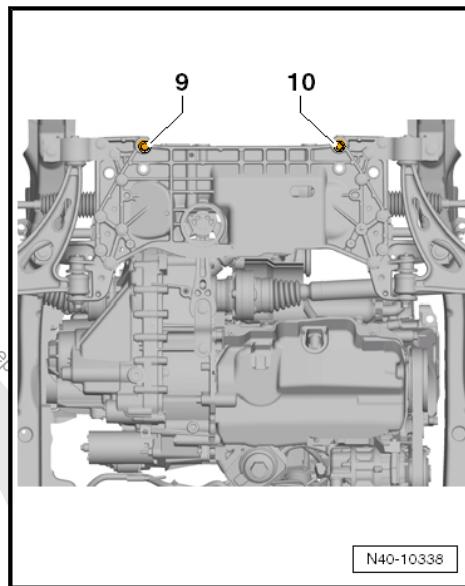


- Remove the stabilizer bar bolts -7- and -8-.



- Remove the subframe bolts -9- and -10-.





- Lower the subframe using the Engine and Gearbox Jack VAS 6931.
- Secure the steering gear to the body.

Installing

Install in reverse order of removal.

- Install and tighten the noise insulation. Refer to ⇒ Body Exterior; Rep. Gr. 50; Overview - Noise Insulation for the tightening specifications.
- Install the wheels. Refer to ⇒ [Mounting Tightening Specifications](#), page 315 .

Tightening Specifications

Component	Tightening Specification
Control arm to cast-steel control arm ◆ Use new nuts	60 Nm
Control arm to steel panel or aluminum control arm ◆ Use new nuts	100 Nm
Subframe to body ◆ Different versions ◆ Allocation. Refer to the ⇒ Electronic Parts Catalog (ETKA). ◆ Use new bolts.	◆ M12 x 1.5 x 100: 70 Nm + 90° ◆ M12 x 1.5 x 110: 70 Nm
Mounting bracket to body ◆ Use new bolts.	70 Nm + 90°
Bracket to body ◆ Use new bolts.	70 Nm + 90°
Stabilizer bar to subframe ◆ Use new bolts.	20 Nm + 90°
Stabilizer bar to coupling rod ◆ Use a new nut ◆ Counterhold at joint pin inner multi-point fitting	65 Nm



Component	Tightening Specification
Shield to subframe ◆ M6 bolt is self-tapping	6 Nm
Steering gear to subframe ◆ Use new bolts.	50 Nm + 90°
Exhaust system bracket to subframe. Refer to ⇒ Engine Mechanical, Fuel Injection and Ignition; Rep. Gr. 26.	

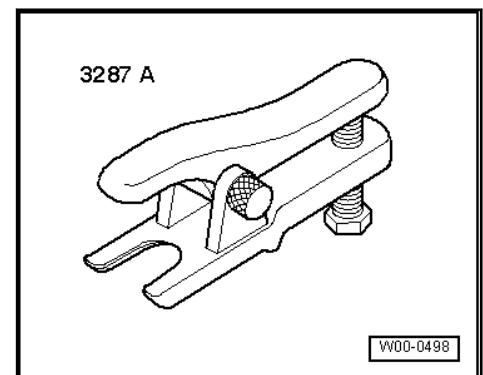
Tightening specification, pendulum support to the transmission

Bolt	Tightening Specification
M10 x 35 ◆ Use a new bolt	50 Nm + 90° additional turn
M10 x 75 ◆ Use a new bolt	50 Nm + 90° additional turn

3.8 Subframe with Steering Gear, Removing and Installing

Special tools and workshop equipment required

- ◆ Puller - Ball Joint - 3287 A-



- ◆ Torque Wrench, 40-200Nm -V.A.G 1332A-



Removing

- Turn the steering wheel in the straight position and remove the ignition key so that the steering wheel lock engages.

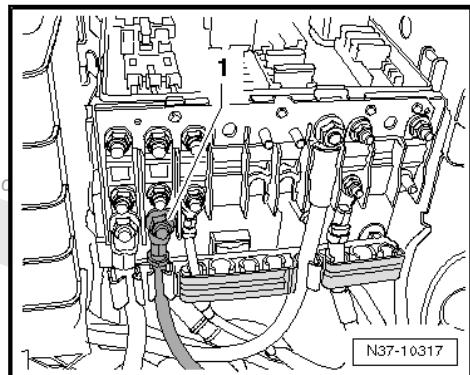


Vehicles with "Keyless Access" keyless locking and starting system

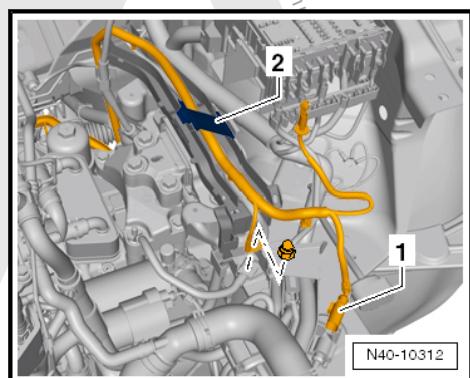
- Switch the ignition off and open the driver door so the steering wheel lock engages.

Continuation for all vehicles

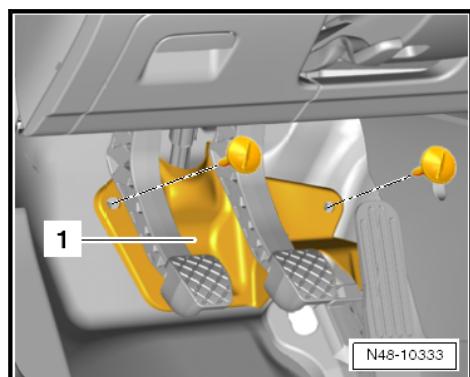
- Remove the battery and the battery tray. Refer to ⇒ Electrical Equipment; Rep. Gr. 27; Battery, Removing and Installing.
- Disconnect the cable -1- from the E-box.



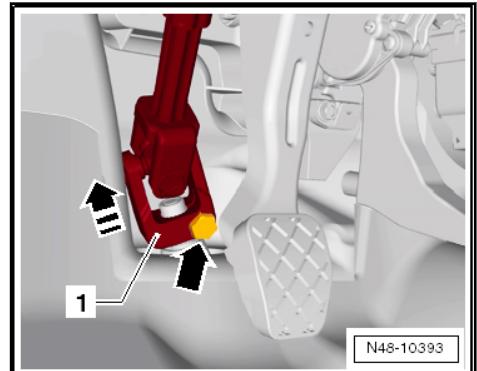
- Disconnect the connector -1-.



- Remove the cap nut and ground cable.
- Open the cover -2-
- Remove the wiring harness from the bracket on the longitudinal member so that it can be removed together with the steering gear.
- Remove the footwell trim panel -1--



- Remove the bolt -arrow- from the universal joint -1-, and then remove the universal joint in the -direction of the arrow-.

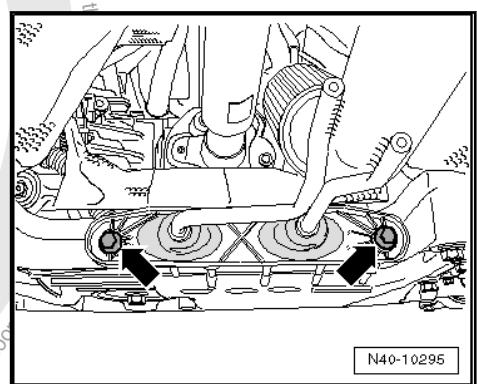

Caution

If the universal joint is separated from the steering gear, the following work cannot be performed:

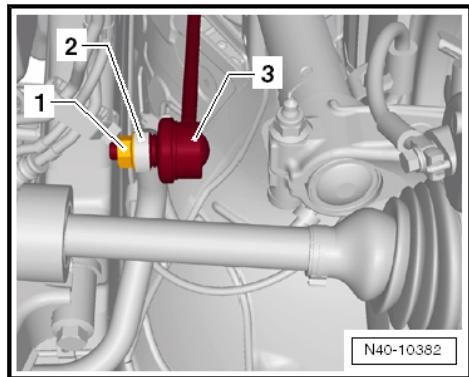
- ◆ *Switching on the ignition*
- ◆ *Turning the steering gear*
- ◆ *Turning the steering column.*

These points must be observed since performing these actions could cause irreparable damage.

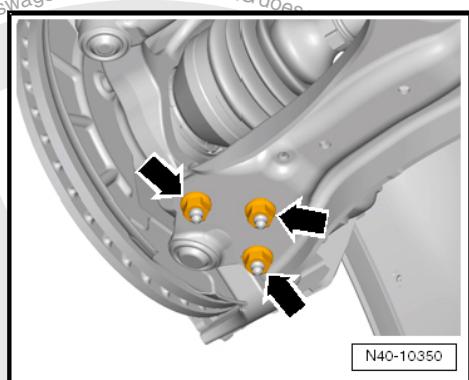
- Remove the front wheels.
- Remove the lower noise insulation. Refer to ⇒ Body Exterior; Rep. Gr. 50; Overview - Noise Insulation.
- Disconnect the connector for the Oil Level Thermal Sensor - G266- at the oil pan and remove the wire from the subframe.
- Remove the exhaust system bracket from the subframe -arrows-.



- Remove the hex nut -1- from the right and left coupling rod -3-.



- Remove the coupling rod -3- from the stabilizer bar -2- on the left and right sides.
- Remove the nuts -arrows- on the left and right side of the vehicle.



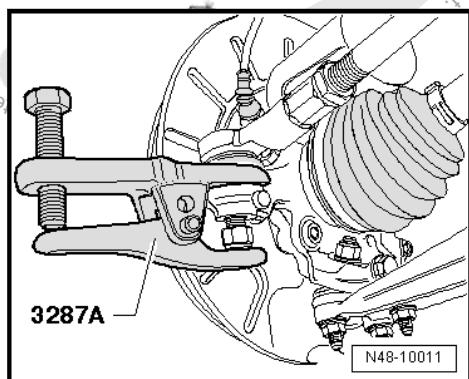
- Remove the control arm from the ball joint.
- Loosen the nut of the tie rod end, but do not remove yet.



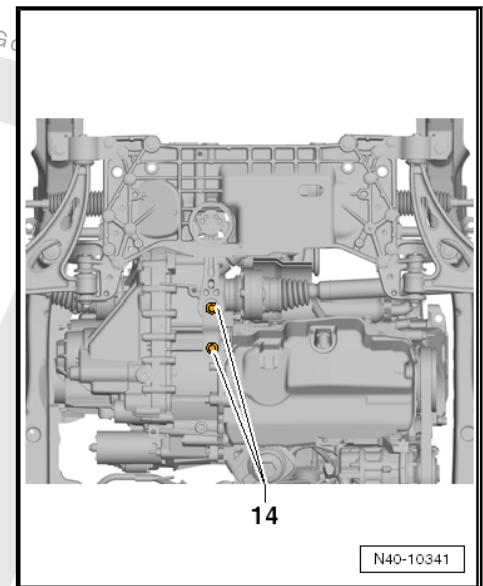
Caution

To protect the thread, screw the nut on the pin several turns.

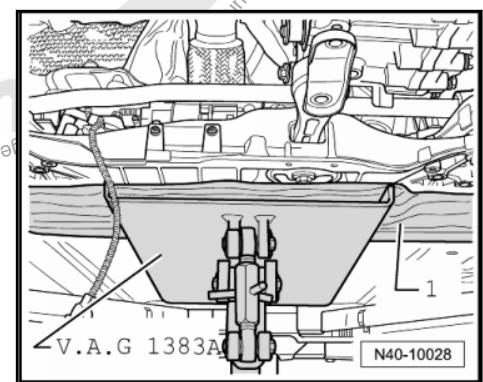
- Press off tie rod end from wheel bearing housing with Puller - Ball Joint -3287A- and then remove nut.



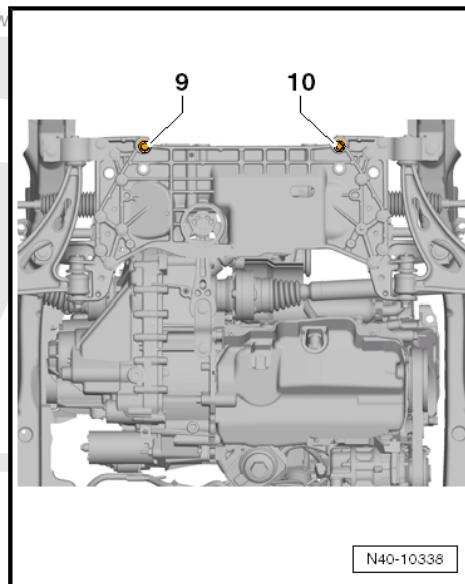
- Remove the bolts -14- and then remove the pendulum support from the transmission.



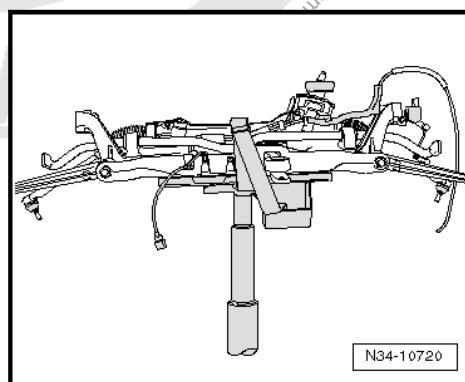
- Secure the subframe. Refer to [⇒ a3.5 nd Brackets, Securing](#), page 16 .
- Place the Engine and Gearbox Jack -VAS 6931- under the subframe.



- Place, for example, a block of wood -1- between the Engine and Gearbox Jack -VAS 6931- and the subframe.
- Remove the bolts -9- and -10- and lower the subframe slightly with the brackets. Observe the wires when doing this.



- Lower the Engine and Gearbox Jack -VAS 6931- slowly while guiding the steering gear wiring harness.
- Secure the subframe on the Engine and Gearbox Jack -VAS 6931- with the corresponding strap.



Installing

Install in reverse order of removal.

- Install and tighten the noise insulation. Refer to ⇒ Body Exterior; Rep. Gr. 50; Overview - Noise Insulation for the tightening specifications.
- Install the wheels. Refer to [⇒ M2 ounting Tightening Specifications](#), page 315 .
- Install the battery tray and the battery. Refer to ⇒ Electrical Equipment; Rep. Gr. 27; Battery, Removing and Installing.

Tightening Specifications

Component	Tightening Specification
Control arm to cast-steel control arm ◆ Use new nuts	60 Nm
Control arm to steel panel or aluminum control arm ◆ Use new nuts	100 Nm



Component	Tightening Specification
Subframe to body ◆ Different versions ◆ Allocation. Refer to the ⇒ Electronic Parts Catalog (ETKA). ◆ Use new bolts.	◆ M12 x 1.5 x 100: 70 Nm + 90° ◆ M12 x 1.5 x 110: 70 Nm
Mounting bracket to body ◆ Use new bolts.	70 Nm + 90°
Bracket to body ◆ Use new bolts.	70 Nm + 90°
Stabilizer bar to coupling rod ◆ Use a new nut ◆ Counterhold at joint pin inner multi-point fitting	65 Nm
Tie rod end to wheel bearing housing ◆ Use a new nut	20 Nm + 90°
Universal joint to steering gear ◆ Use a new bolt	30 Nm
Exhaust system bracket to subframe. Refer to ⇒ Engine Mechanical, Fuel Injection and Ignition; Rep. Gr. 26.	

Tightening specification, pendulum support to the transmission

Bolt	Tightening Specification
M10 x 35 ◆ Use a new bolt	50 Nm + 90° additional turn
M10 x 75 ◆ Use a new bolt	50 Nm + 90° additional turn

3.9 Subframe, Servicing

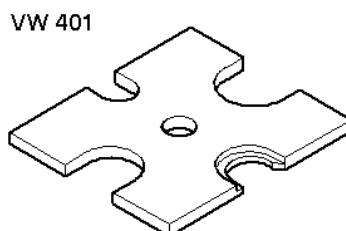


Special tools and workshop equipment required

T10205		V.A.G 1332	
VA S 6178		VA S 6179	
VA S 6779			

W40-10068

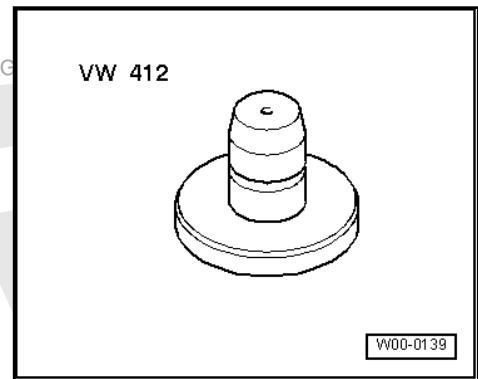
- ◆ Bearing Installer - Wheel Hub/Bearing Kit -T10205-
- ◆ Torque Wrench, 40-200Nm -V.A.G 1332A-
- ◆ Hydraulic Press -VAS 6178-
- ◆ Pneumatic/Hydraulic Foot Pump -VAS 6179-
- ◆ Rubber Bushing Assembly Device Kit -VAS 6779A-
- ◆ Press Plate -VW 401-



VW00-0135

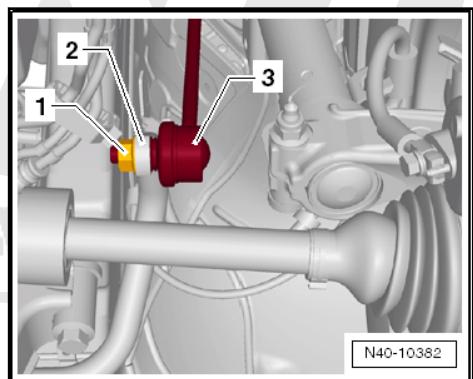


◆ Press Piece - Multiple Use -VW 412-

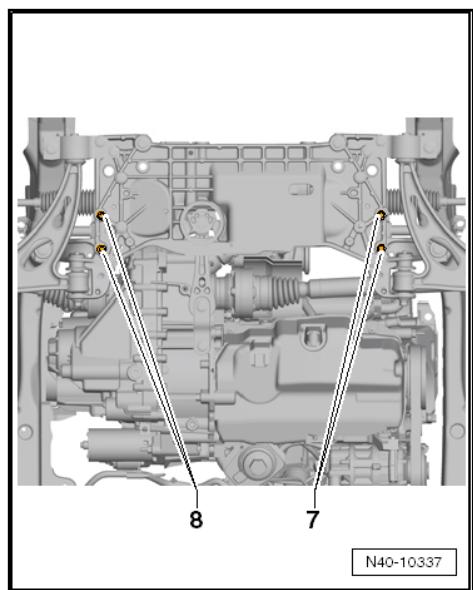


Replacing the bonded rubber bushing for the pendulum support.

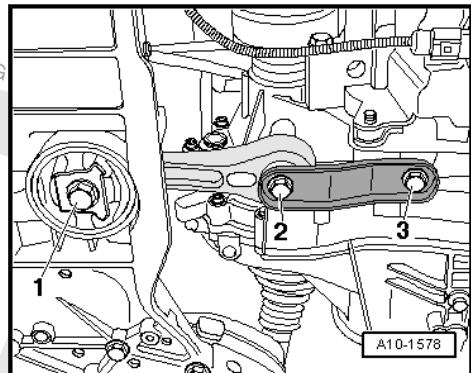
- Remove the front noise insulation. Refer to ⇒ Body Exterior; Rep. Gr. 50; Noise Insulation; Overview - Noise Insulation.
- Remove the hex nut -1- from the right and left coupling rod -3-.



- Remove the coupling rod -3- from the stabilizer bar -2- on the left and right sides.
- Remove the stabilizer bar bolts -7- and -8-.



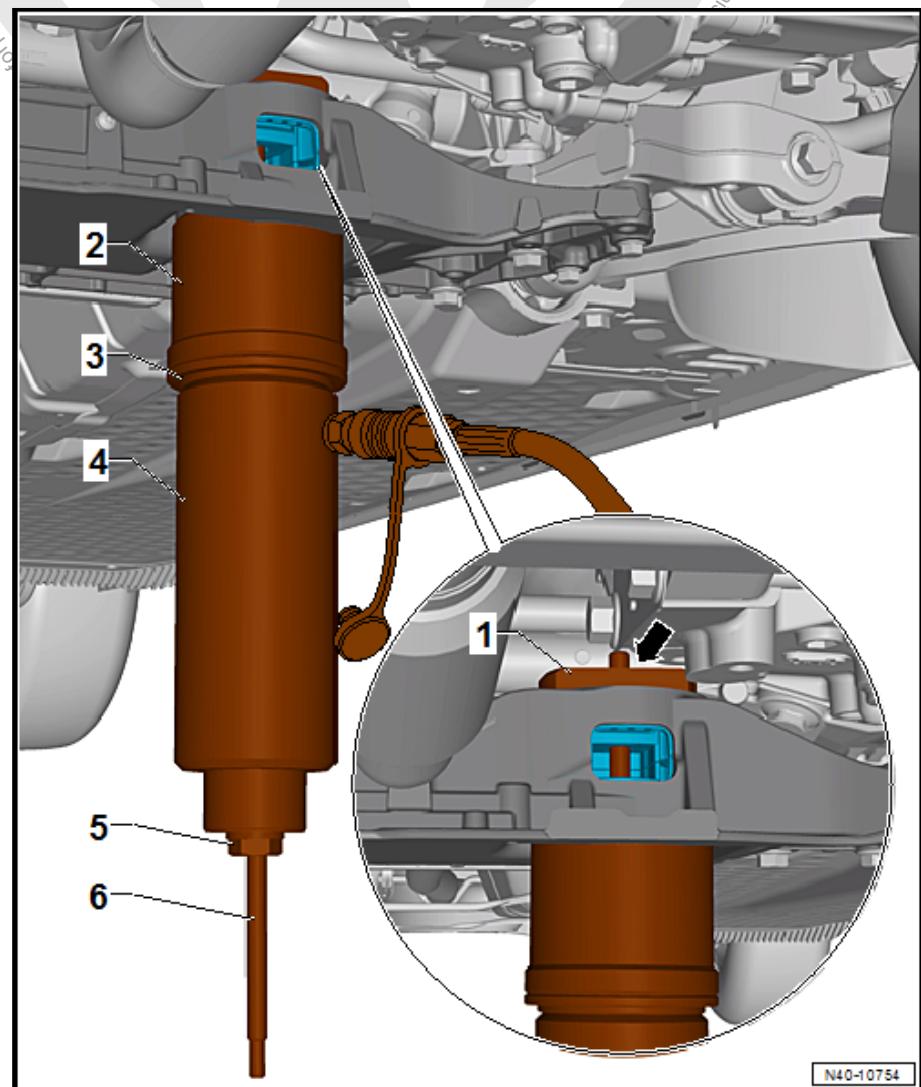
- Leave the stabilizer bar in the installation position on the vehicle.
- Remove the bolt -1-.



- Remove the bolts -2- and -3-.
- Remove the pendulum support.

Bonded Rubber Bushing, Pressing Out

- Install the Rubber Bushing Assembly Device Kit -VAS 6779A- on the subframe as shown.
- Position the Rubber Bushing Assembly Device Kit - Thrust Piece -VAS 6779/1- -1- with the flat side -arrow- on the bonded rubber bushing in the direction of travel.



1 - Rubber Bushing Assembly Device Kit - Thrust piece -VAS 6779/1-

2 - Tube -VAS 6779/4-, with the small outer diameter toward the subframe

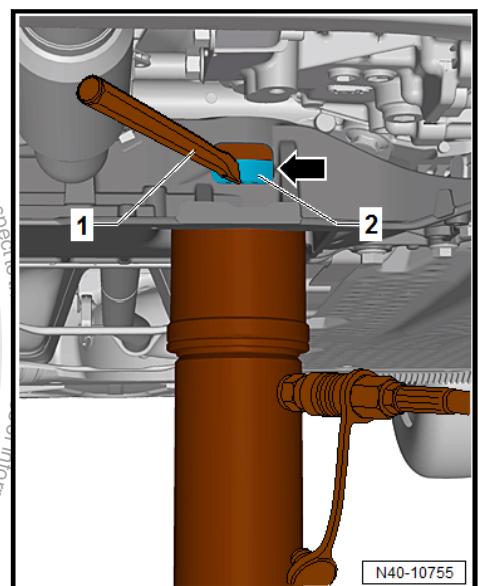
3 - Rubber Bushing Assembly Device Kit -Thrust Piece -VAS 6779/5-

4- Hydraulic Press -VAS 6178- with Bearing Installer - Wheel Hub/Bearing Kit- Adapter 13 -T10205/13-

5 - Rubber Bushing Assembly Device Kit - Hexagon Nut -VAS 6779/3-

6 - Rubber Bushing Assembly Device Kit -Threaded Rod -VAS 6779/2-

- Press out both bonded rubber bushings until the upper bonded rubber bushing -2- is visible in the pendulum support opening arrow- in the subframe.



- Perform a visual inspection of the upper bonded rubber bushing outer race -2-.
- If the upper bonded rubber bushing outer race -2- is deformed, it must be destroyed through the opening for the pendulum support arrow- in the subframe.
- Using a chisel or similar tool -1-, make a break in the upper bonded rubber bushing outer race -2-.



Note

This work sequence is necessary to prevent tilting of the bonded rubber bushing outer race in the area of the pendulum support opening in the subframe.

- Completely press out both bonded rubber bushings at the same time.

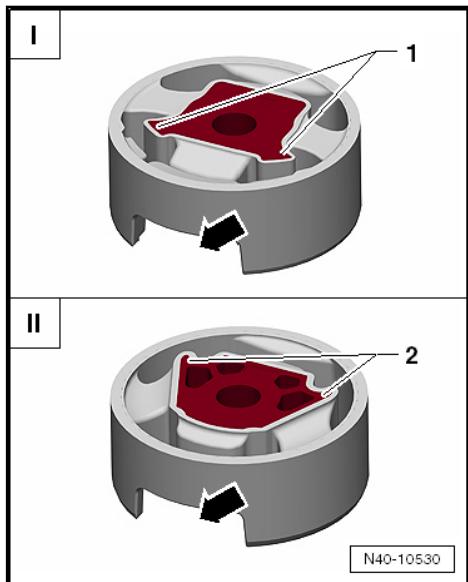


Preparing bonded rubber bushings before pressing in



Note

There are two different versions of the pendulum support bonded rubber bushing: the T version -I- and the V version -II-.

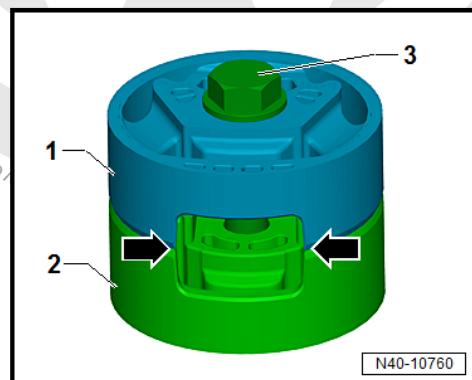


Refer to the ⇒ *Electronic Parts Catalog (ETKA)* for the allocation.

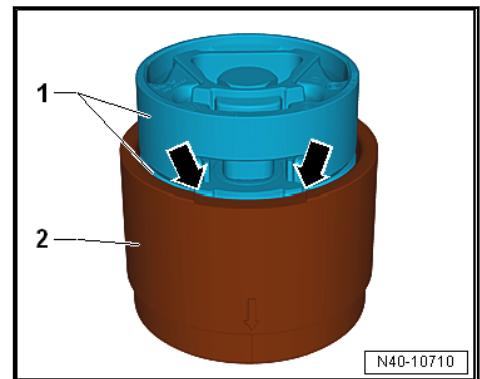
I - The corners on the inner core -1- face toward the opening for the pendulum support -arrow- (T version).

II - The corners on the inner core -2- face away from the opening for the pendulum support -arrow- (V version).

- Place the bonded rubber bushings -1- and -2- on top of each other so the openings -arrows- lay directly over each other.

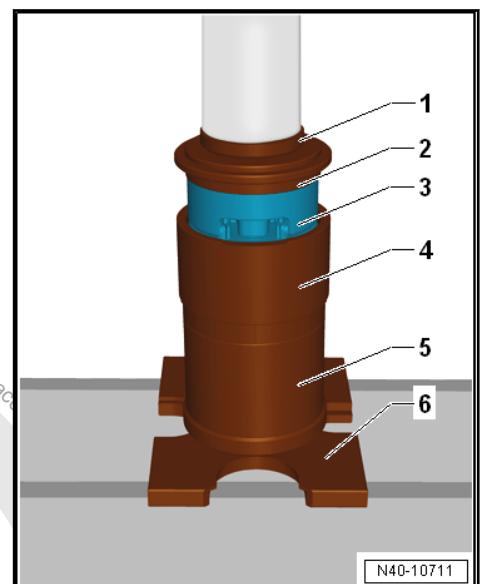


- Tighten the bonded rubber bushings -1- and -2- using the original bolt -3- hand tight.
- Place the bonded rubber bushing -1- with the bolt head facing up in the larger diameter of the Rubber Bushing Assembly Device Kit - Funnel -VAS 6779/6- -2-.



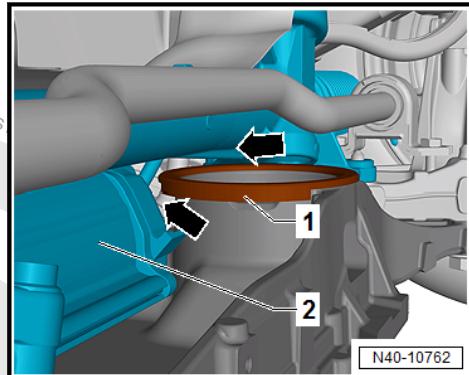
N40-10710

- Align the bonded rubber bushing -1- in the Rubber Bushing Assembly Device Kit - Funnel -VAS 6779/6- -2-. The opening in the bonded rubber bushing must directly face the recess -arrows- in the Rubber Bushing Assembly Device Kit - Funnel -VAS 6779/6- -2-.
- Press the bonded rubber bushing -3- in the Rubber Bushing Assembly Device Kit - Funnel -VAS 6779/6- until it stops as shown.



N40-10711

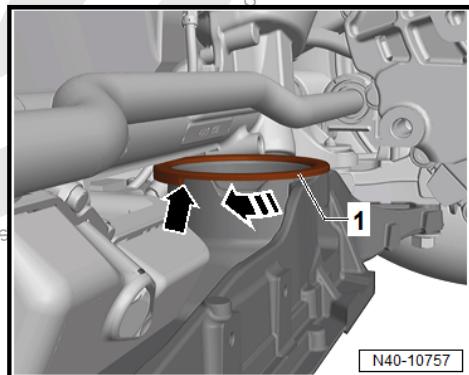
- 1 - Press Piece - Multiple Use -VW 412-
- 2 - Rubber Bushing Assembly Device Kit -Thrust Piece -VAS 6779/5-, the side with the letter »A« points upward
- 3 - Bonded Rubber Bushing
- 4 - Rubber Bushing Assembly Device Kit - Funnel -VAS 6779/6-
- 5 - Rubber Bushing Assembly Device Kit - Tube -VAS 6779/4-
- 6 - Press Plate -VW 401-
- Remove the bolt from the bonded rubber bushing.
- Position the Hydraulic Press - Bushing Tool Kit Support Ring -VAS 6779/11- -1- on the subframe so that the tab on the right points to the left.



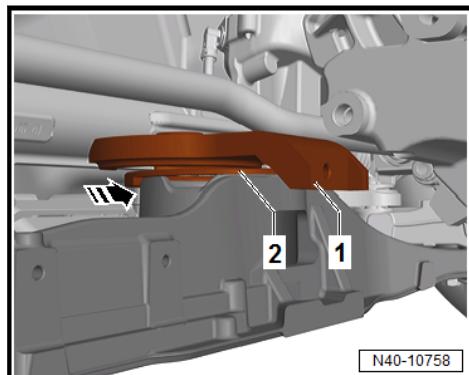
Note

Make sure there is enough clearance to the steering gear -2- when positioning the Hydraulic Press - Bushing Tool Kit Support Ring - VAS 6779/11- -arrows-.

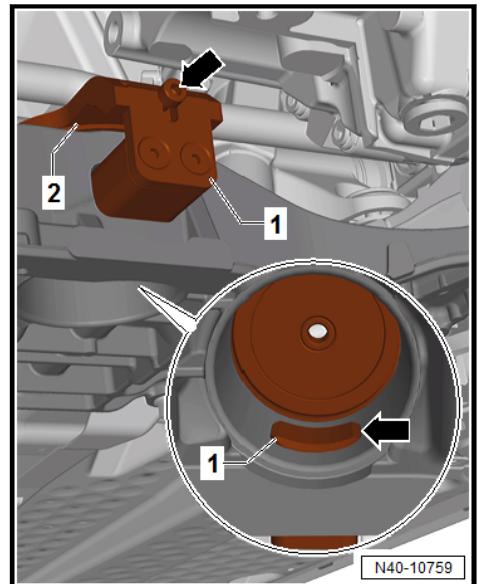
- Turn the Support Ring -VAS 6779/11- -1- in the -direction of the arrow- so that the tab -arrow- points to the rear.



- Position the Counter Hold -VAS 6779/7- -1- from the left onto the Support Ring -VAS 6779/11- in the -direction of the arrow-.



- Insert the Counterhold -VAS 6779/7-1A- -1- into the pendulum support opening in the subframe.



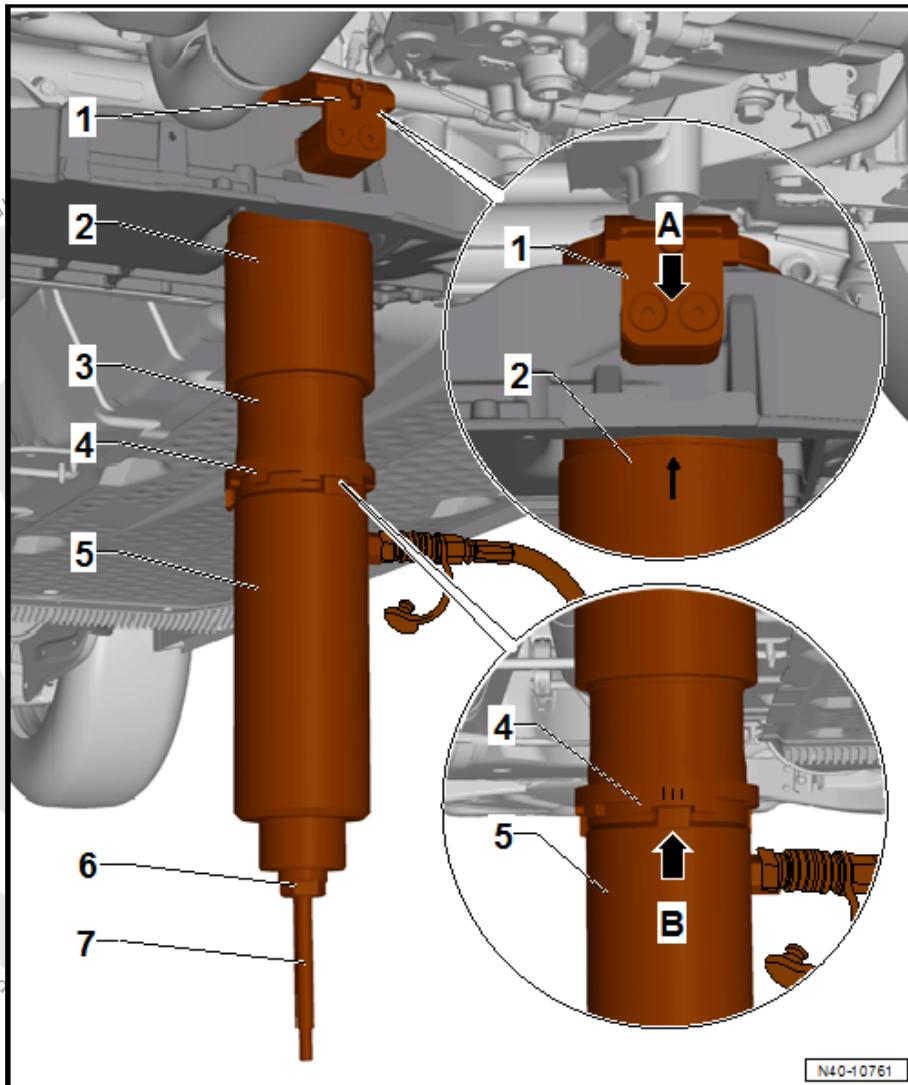
- Install the Counterhold -VAS 6779/7-1A- on the Counterhold -VAS 6779/7- -2- with the bolt -arrow-.
- Make sure that the Counterhold -VAS 6779/7-1A- -1- is seated correctly in the subframe opening -arrow-.

Bonded Rubber Bushing, Pressing In

- Screw the Rubber Bushing Assembly Device Kit -Threaded Rod -VAS 6779/2- -7- into the Rubber Bushing Assembly Device Kit - Counterhold -VAS 6779/7- -1-.
- Attach the Rubber Bushing Assembly Device Kit -VAS 6779A- to the subframe as shown.



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1 - Rubber Bushing Assembly Device Kit - Counterhold -VAS 6779/7-

2 - Funnel -VAS 6779/6-, -arrow marking- on the Funnel must be in the center of both opposing bolts -arrow A-.

3 - Rubber Bushing Assembly Device Kit - Thrust Piece -VAS 6779/9-

4 - Rubber Bushing Assembly Device Kit - Incremental Ring -VAS 6779/8-, the marking -IIII- on the Incremental Ring must point to the cam -arrow B- on the Rubber Bushing Assembly Device Kit -Thrust Piece -VAS 6779/9-.

5 - Hydraulic Press -VAS 6178- with Bearing Installer - Wheel Hub/Bearing Kit Pressure Head -T10205/13-.

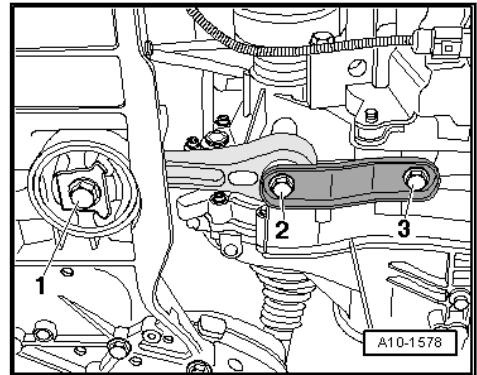
6 - Hydraulic Press - Bushing Tool Kit - Hexagon Nut -VAS 6779/3-

7 - Hydraulic Press - Bushing Tool Kit - Threaded Rod -VAS 6779/2-

- Press in both bonded rubber bushings at the same time.
- Remove the Rubber Bushing Assembly Device Kit -VAS 6779- from the subframe and check the position of the pressed in bonded rubber bushing.



- Fasten the stabilizer bar with the subframe and the coupling rod.
- Insert the pendulum support.



- Install the bolts -2- and -3- and tighten.
- Install the bolt -1- and tighten.
- Install the front noise insulation. Refer to ⇒ Body Exterior; Rep. Gr. 50; Noise Insulation; Overview- Noise Insulation.

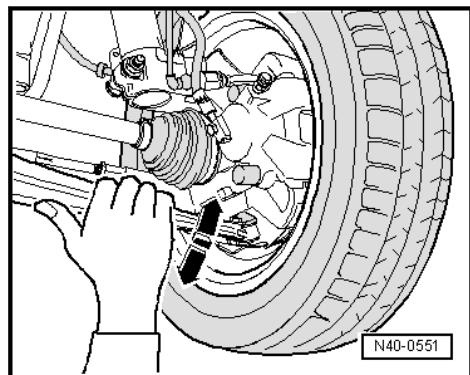
Tightening Specifications

Bolt	Tightening Specification
Pendulum support to the transmission M10 x 35 ◆ Use a new bolt	50 Nm + 90° additional turn
Pendulum support to the transmission M10 x 75 ◆ Use a new bolt	50 Nm + 90° additional turn
Pendulum support to the subframe M14 x 1.5 x 70 ◆ Use a new bolt ◆ Only tighten when pendulum support is bolted to transmission	100 Nm + 90° additional turn
Stabilizer bar to coupling rod ◆ Use a new nut ◆ Counterhold at joint pin inner multi-point fitting	65 Nm
Stabilizer bar to subframe ◆ Use new bolts.	20 Nm + 90°

3.10 Ball Joint, Checking

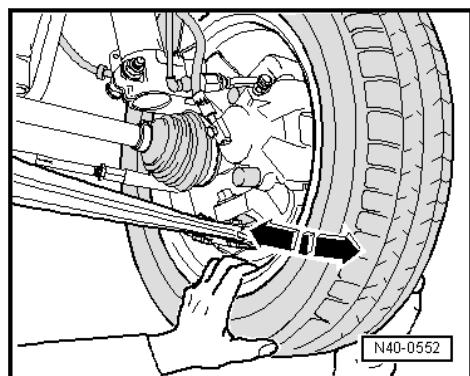
Axial Play, Checking

- Forcefully pull the control arm down in the -direction of the arrow- and press it up again.



Radial Clearance, Checking

- Forcefully push the lower part of wheel inward and outward in the -direction of the arrow-.



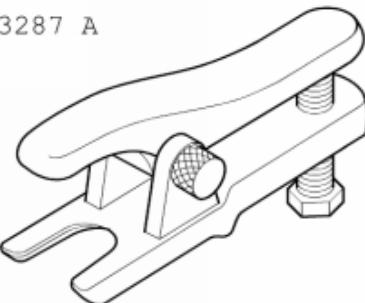
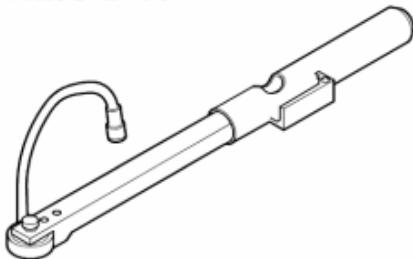
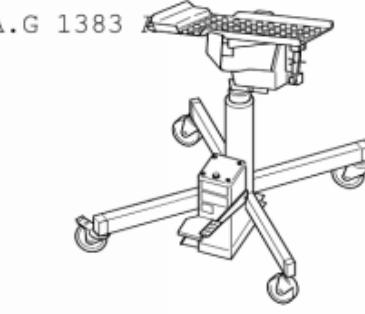
Note

- There should not be any noticeable or visible "play" in either of the two checks.
- Pay attention to the ball joint while performing checks.
- Make allowance for any wheel bearing play or "play" in the upper strut mount
- Check the rubber boot for damage and replace the lower ball joint, if necessary.

3.11 Ball Joint, Removing and Installing



Special tools and workshop equipment required

 3287 A	 V.A.G 1332
 V.A.G 1756	 V.A.G 1383 A
	W40-10000

- ◆ Puller - Ball Joint -3287A-
- ◆ Torque Wrench, 40-200Nm -V.A.G 1332A-
- ◆ Engine and Gearbox Jack -VAS 6931-
- ◆ Digital Torque Wrench -V.A.G 1756A-

Removing

- Loosen the drive axle bolt on the wheel hub:
- ◆ Twelve-point bolt with ribs. Refer to [⇒ B6.1 olt with Ribs, Loosening and Tightening, Drive Axle Threaded Connection](#), page 94 .
- ◆ Twelve-point bolt without ribs. Refer to [⇒ B6.2 olt without Ribs, Loosening and Tightening, Drive Axle Threaded Connection](#), page 96 .



VerWin

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Caution

Do not load the wheel bearing if the wheel-side drive axle threaded connection is loose.

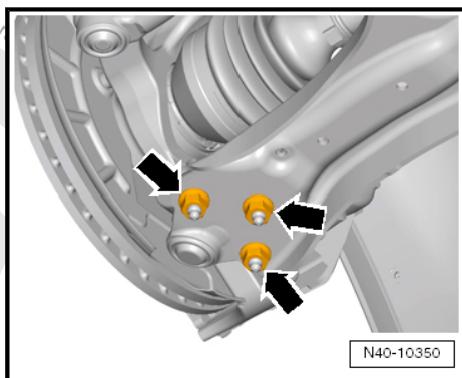
If the wheel bearings are under the load of the vehicle weight, the wheel bearing will be damaged. This reduces the service life of the wheel bearings.

The drive axle bolt may be loosened maximum 90° when the vehicle is standing on its wheels.

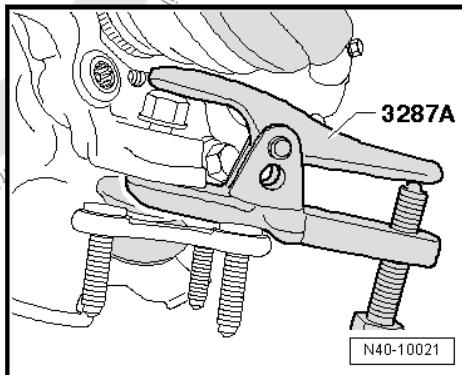
Vehicles without a drive axle must not be moved, otherwise the wheel bearing will be damaged. If a vehicle must be moved, be sure to note the following:

- ◆ *Install an outer joint in place of the drive axle.*
- ◆ *Tighten the outer joint to 120 Nm.*

- Remove the wheel.
- Remove the nuts -arrows-



- Pull the drive axle slightly off the wheel hub.
- Remove the control arm from the ball joint.
- Bend control arm as far downward as necessary.
- Attach the Puller - Ball Joint -3287 A- as depicted in the illustration and press out the ball joint.

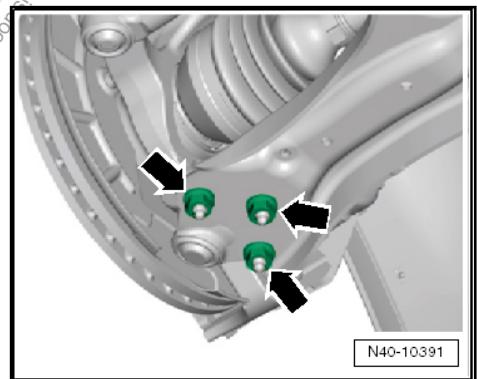


**Note**

- ◆ Place the Engine and Gearbox Jack -VAS 6931- or something similar underneath (danger of accident if parts fall off when ejecting ball joint).
- ◆ To protect ball joint threads, leave the nut on the ball joint several turns.

Installing

- Insert the ball joint into wheel bearing housing.
- Install the drive axle in wheel hub.
- Screw the new self-locking nut onto the ball joint, counterhold using 40-Pin Connector -T40- while doing this.
- Tighten the nuts -arrows-.



N40-10391

**Note**

Make sure the ball joint boot is not damaged or twisted.

- Tighten the drive axle bolt to the wheel hub:
- ◆ Twelve-point bolt with ribs. Refer to [B6.1 olt with Ribs, Loosening and Tightening, Drive Axle Threaded Connection](#), page 94 .
- ◆ Twelve-point bolt without ribs. Refer to [B6.2 olt without Ribs, Loosening and Tightening, Drive Axle Threaded Connection](#), page 96 .

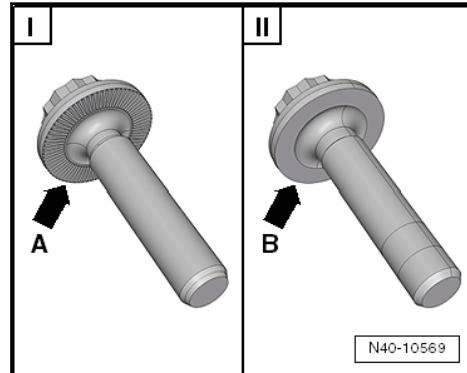
**Caution**

The vehicle must not be resting on the wheels when doing so.

When the bolt is loose, the wheel bearing can be damaged by the weight of the vehicle.



Difference between a twelve-point bolt with ribs and a twelve-point bolt without ribs



The contact surfaces -arrow A- and -arrow B- are different on the two-point bolts.

I - Twelve-Point Bolt with Ribs -arrow A-

II - Twelve-Point Bolt without Ribs -arrow B-

- Install the wheel and tighten to the tightening specification.
Refer to [M2 Counting Tightening Specifications](#), page 315 .

Tightening Specifications

Component	Tightening Specification
Control arm to cast-steel control arm ◆ Use new nuts	60 Nm
Control arm to steel panel or aluminum control arm ◆ Use new nuts	100 Nm
Ball joint to wheel bearing housing ◆ Use a new nut	60 Nm
Drive axle to wheel hub "twelve-point bolt with ribs" ◆ Use a new bolt	70 Nm + 90°
Drive axle to wheel hub "twelve-point bolt without ribs" ◆ Use a new bolt	200 Nm + 180°

3.12 Control Arm with Mounting Bracket, Removing and Installing

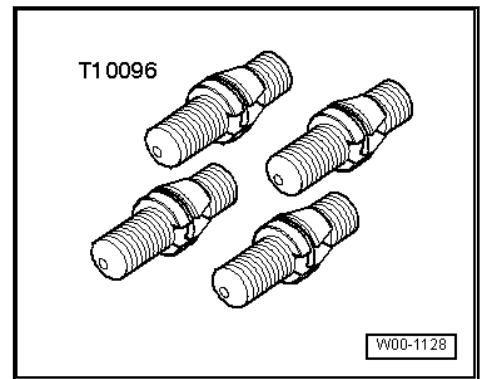
Special tools and workshop equipment required

- ◆ Torque Wrench, 40-200Nm -V.A.G 1332A-



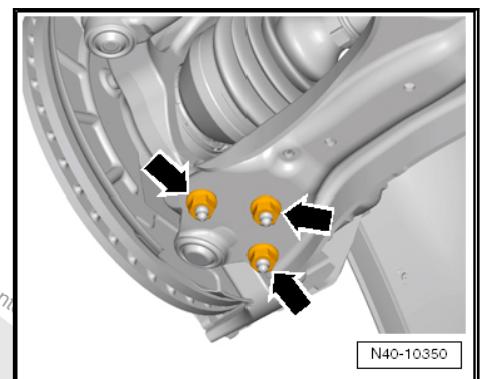


◆ Locating Pins -T10096-

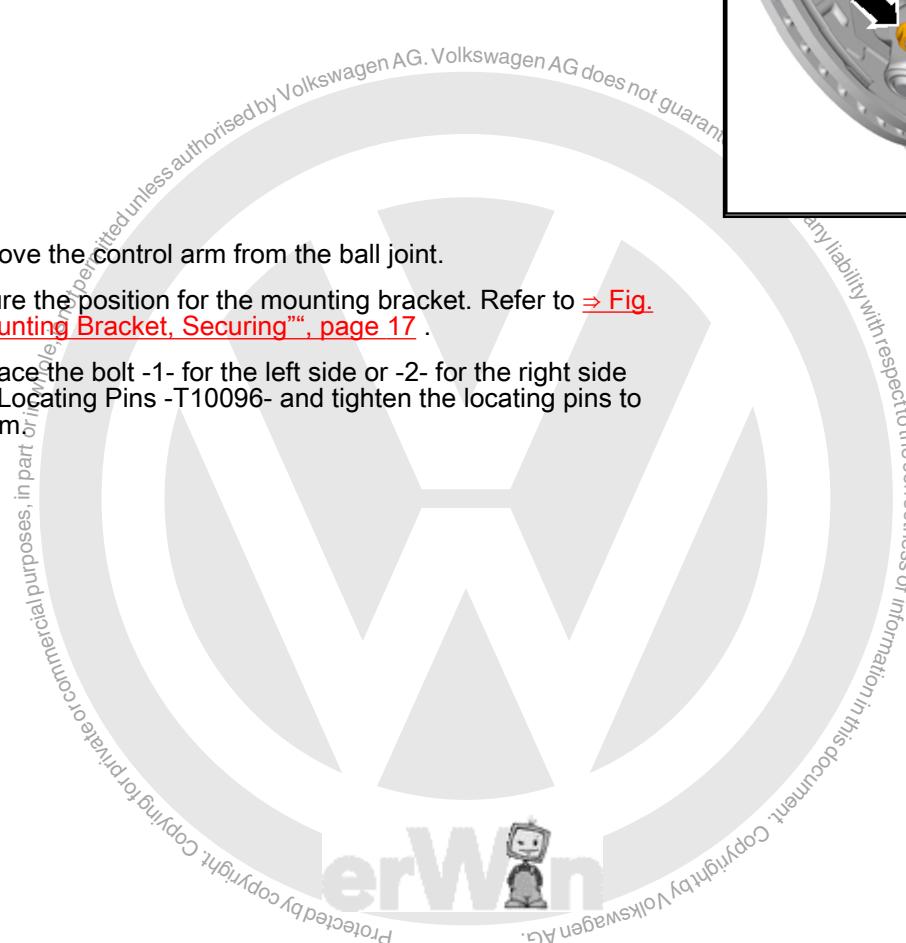


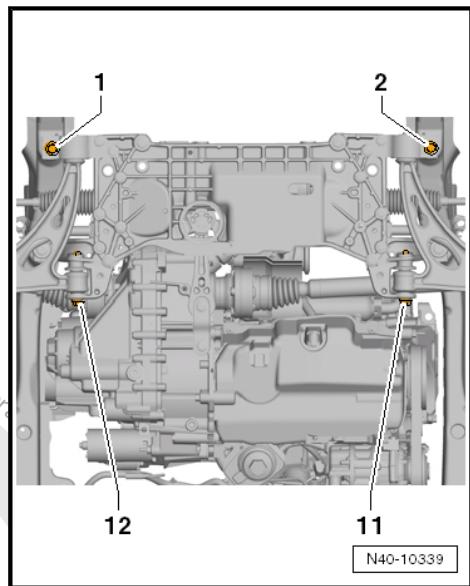
Removing

- Remove the wheel.
- If equipped, remove the coupling rod for the Left Front Level Control System Sensor -G78- or Right Front Level Control Sensor -G289- from the control arm.
- Remove the lower noise insulation. Refer to ⇒ Rep. Gr. 50; Overview - Noise Insulation.
- Remove the nuts -arrows-.



- Remove the control arm from the ball joint.
- Secure the position for the mounting bracket. Refer to ⇒ Fig. ""Mounting Bracket, Securing", page 17 .
- Replace the bolt -1- for the left side or -2- for the right side with Locating Pins -T10096- and tighten the locating pins to 20 Nm.

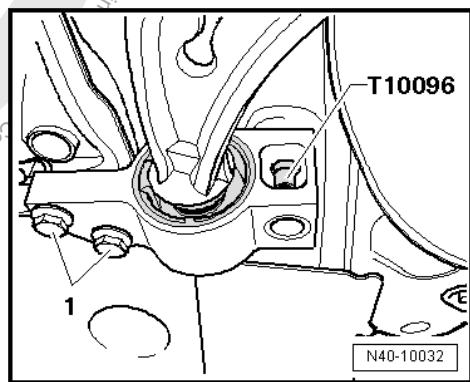




Note

Locating Pins -T10096- may only be tightened to a maximum of 20 Nm, otherwise the threads on the locating pins will be damaged.

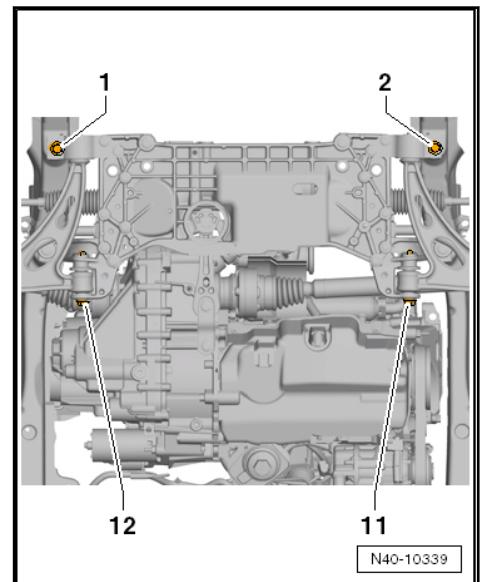
- Remove the bolt -11- for the right side of the vehicle or bolt -12- for the left side of the vehicle.
- Remove the bolts -1-.



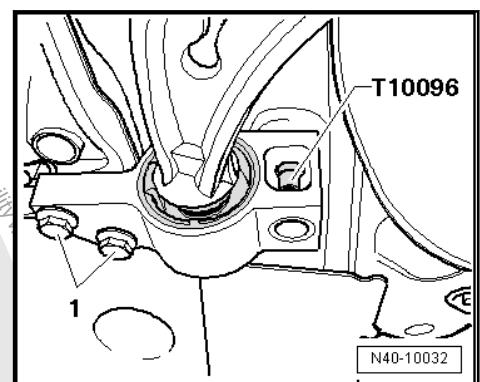
- Remove the control arm with the mounting bracket.

Installing

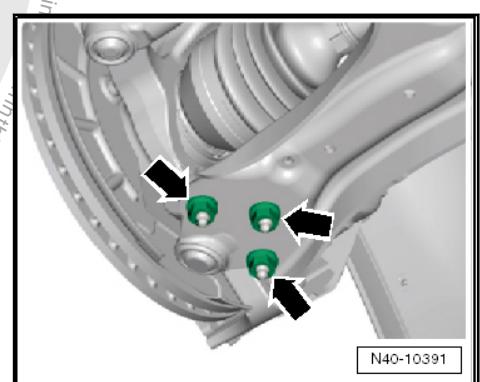
- Insert the control arm with the mounting bracket into the subframe.
- Insert the bolts -11- and -12- but do not tighten.



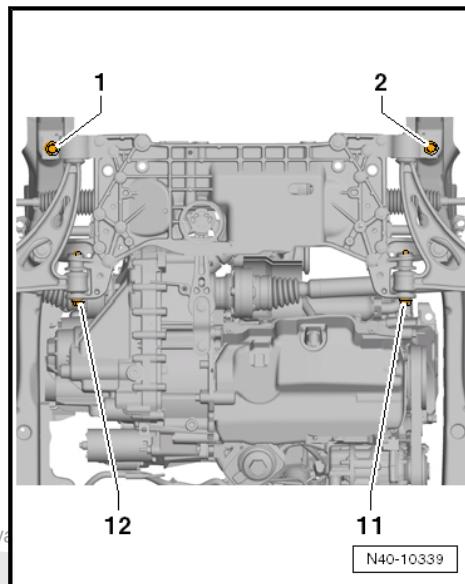
- Insert bolts -1- and tighten.



- Replace the Locating Pins -T10096- with a new bolt and tighten the bolt to the tightening specification.
- Bolt the control arm tightly to ball joint -arrows-.



- Bolt the control arm onto the subframe in curb weight position -11- and -12- Refer to [B2.2 earing, Lifting to Curb Weight Position](#), page 6 .



Further installation is performed in reverse order of the removal.



Make sure the ball joint boot is not damaged or twisted.

- Install the lower noise insulation. Refer to ⇒ Rep. Gr. 50; Overview - Noise Insulation.
- Install the wheel and tighten. Refer to ⇒ [M2 Counting Tightening Specifications](#), page 315 .

Tightening Specifications

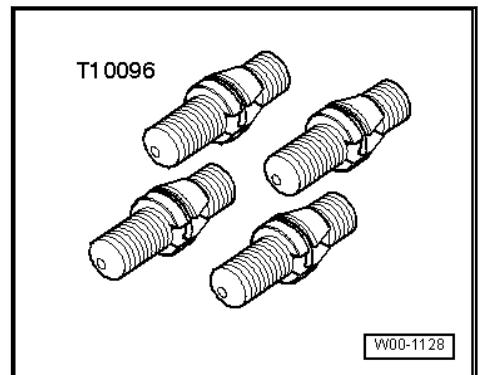
Component	Tightening Specification
Mounting bracket to bracket ◆ Use new bolts.	50 Nm + 90°
Mounting bracket to body ◆ Use new bolts.	70 Nm + 90°
Control arm to cast-steel control arm ◆ Use new nuts	60 Nm
Control arm to steel panel or aluminum control arm ◆ Use new nuts	100 Nm
Control arm to bracket ◆ Use a new bolt ◆ Tighten bolts in curb weight position	70 Nm + 180°

3.13 Control Arm with Mounting Bracket, Removing and Installing, Left Side for Vehicles with DSG or Automatic Transmission

Special tools and workshop equipment required



◆ Locating Pins -T10096-



◆ Engine and Gearbox Jack -VAS 6931-



Removing

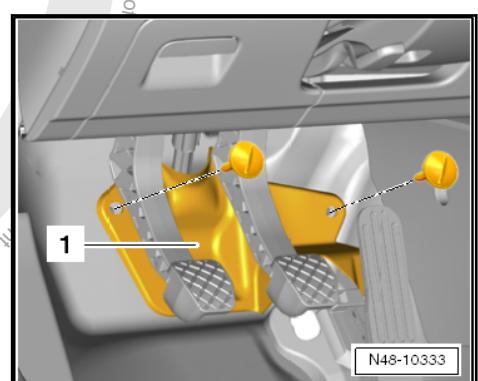
- Turn the steering wheel in the straight position and remove the ignition key so that the steering wheel lock engages.

Vehicles with "Keyless Access" locking and starting system

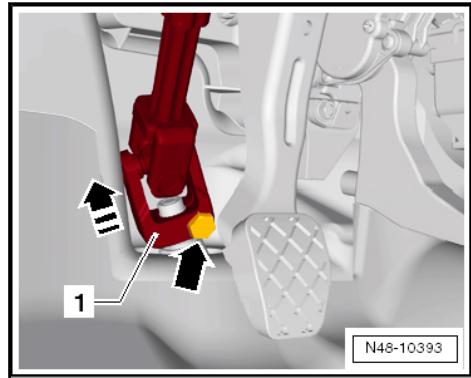
- Switch the ignition off and open the driver door so the steering wheel lock engages.

Continuation for all vehicles

- Remove the footwell trim panel -1-.



- Remove the bolt -arrow- from the universal joint -1-, and then remove the universal joint in the -direction of the arrow-.



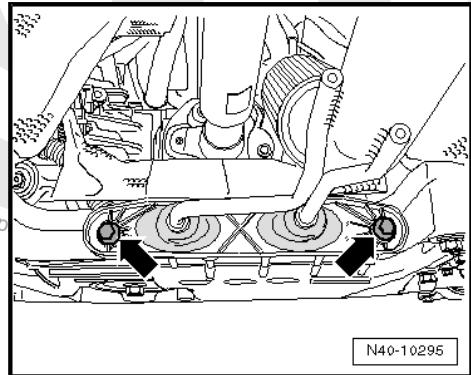
Caution

If the universal joint is separated from the steering gear, the following work cannot be performed:

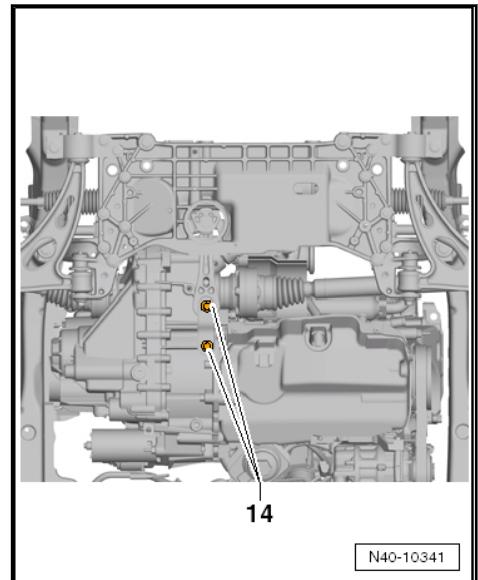
- ◆ *Switching on the ignition*
- ◆ *Turning the steering gear*
- ◆ *Turning the steering column.*

These points must be observed since performing these actions could cause irreparable damage.

- Remove left front wheel.
- Remove the lower noise insulation. Refer to ⇒ Body Exterior; Rep. Gr. 50; Overview - Noise Insulation.
- Remove the exhaust system bracket from the subframe -arrows-.

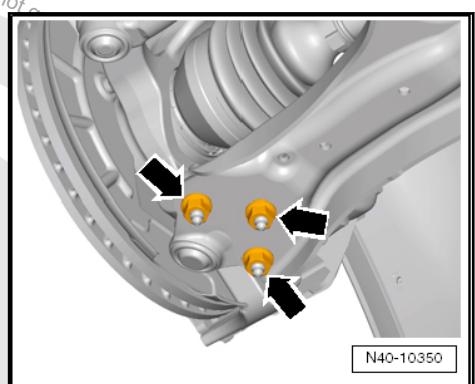


- Remove the bolts -14- and then remove the pendulum support from the transmission.



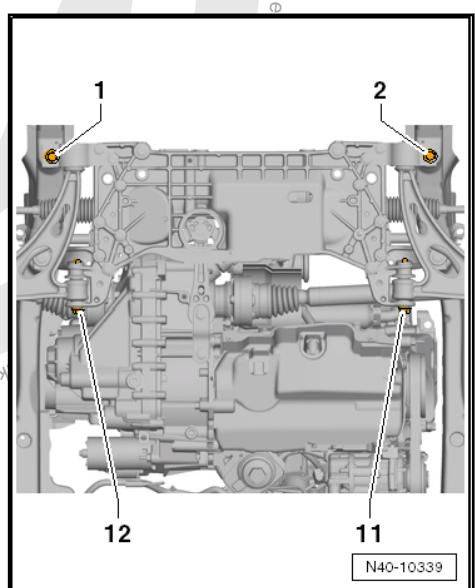
N40-10341

- Remove the nuts -arrows-.



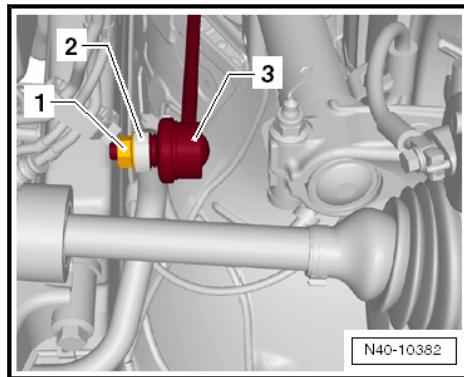
N40-10350

- Loosen the bolt -12-.

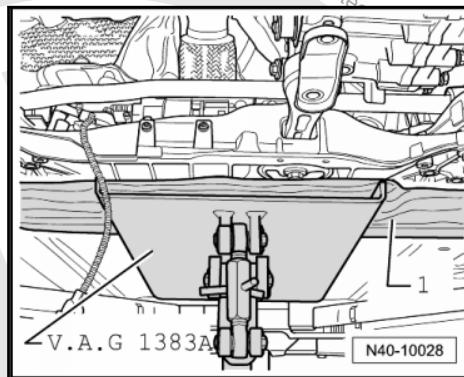


N40-10339

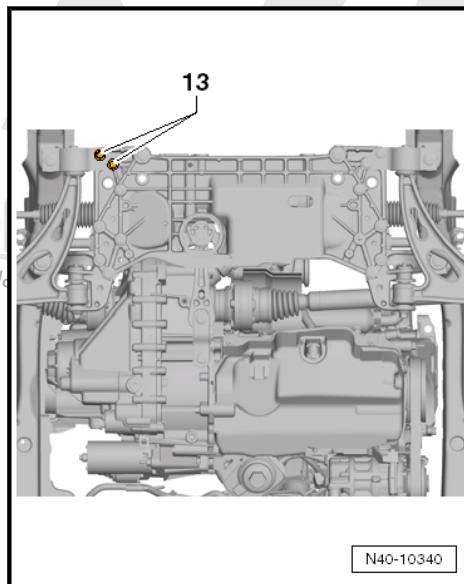
- Remove the right and left nuts -1- from the coupling rods -3-.



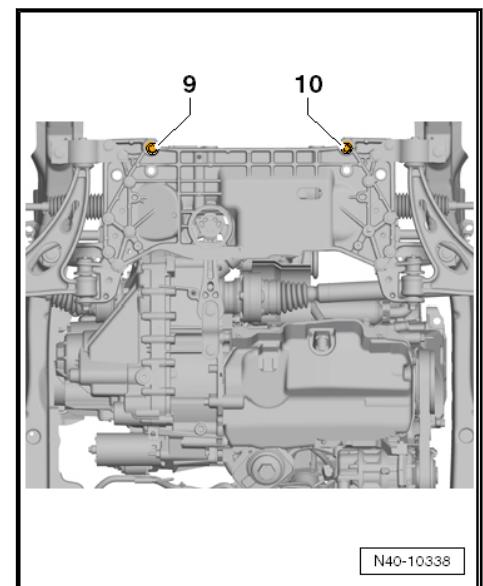
- Remove the coupling rods -3- from the stabilizer bar -2-.
- Secure the subframe. Refer to [⇒ a3.5 nd Brackets, Securing](#), page 16 .
- Place the Engine and Gearbox Jack -VAS 6931- under the subframe.



- Place, for example, a block of wood -1- between the Engine and Gearbox Jack -VAS 6931- and the subframe.
- Remove the bolts -13-.



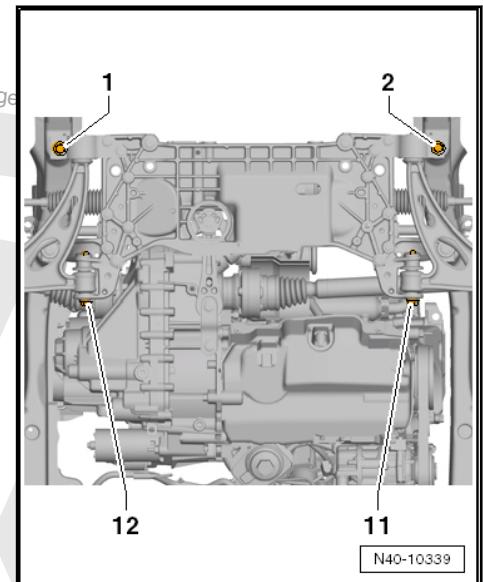
- Remove the bolts -9- and -10- and lower the subframe as far as necessary.



Note

Always pay attention to the steering wire.

- Remove the bolt -12-, and remove the control arm from the subframe.



Installing

Install in reverse order of removal.

Note

Make sure the ball joint boot is not damaged or twisted.

- Install the lower noise insulation. Refer to ⇒ Body Exterior; Rep. Gr. 50; Overview - Noise Insulation.
- Install the wheel and tighten. Refer to [M2 Counting Tightening Specifications](#), page 315 .



Tightening Specifications

Component	Tightening Specification
Subframe to body ◆ Different versions ◆ Allocation. Refer to the ⇒ Electronic Parts Catalog (ETKA). ◆ Use new bolts.	◆ M12 x 1.5 x 100: 70 Nm + 90° ◆ M12 x 1.5 x 110: 70 Nm
Bracket to body ◆ Use new bolts.	70 Nm + 90°
Mounting bracket to bracket ◆ Use new bolts.	50 Nm + 90°
Mounting bracket to body ◆ Use new bolts.	70 Nm + 90°
Control arm to cast-steel control arm ◆ Use new nuts	60 Nm
Control arm to steel panel or aluminum control arm ◆ Use new nuts	100 Nm
Stabilizer bar to coupling rod ◆ Use a new nut ◆ Counterhold at joint pin inner multi-point fitting	65 Nm
Universal joint to steering gear ◆ Use a new bolt	30 Nm
Shield to subframe ◆ M6 bolt is self-tapping	6 Nm
Exhaust system bracket to subframe. Refer to ⇒ Engine Mechanical, Fuel Injection and Ignition; Rep. Gr. 26.	



Tightening specification, pendulum support to the transmission

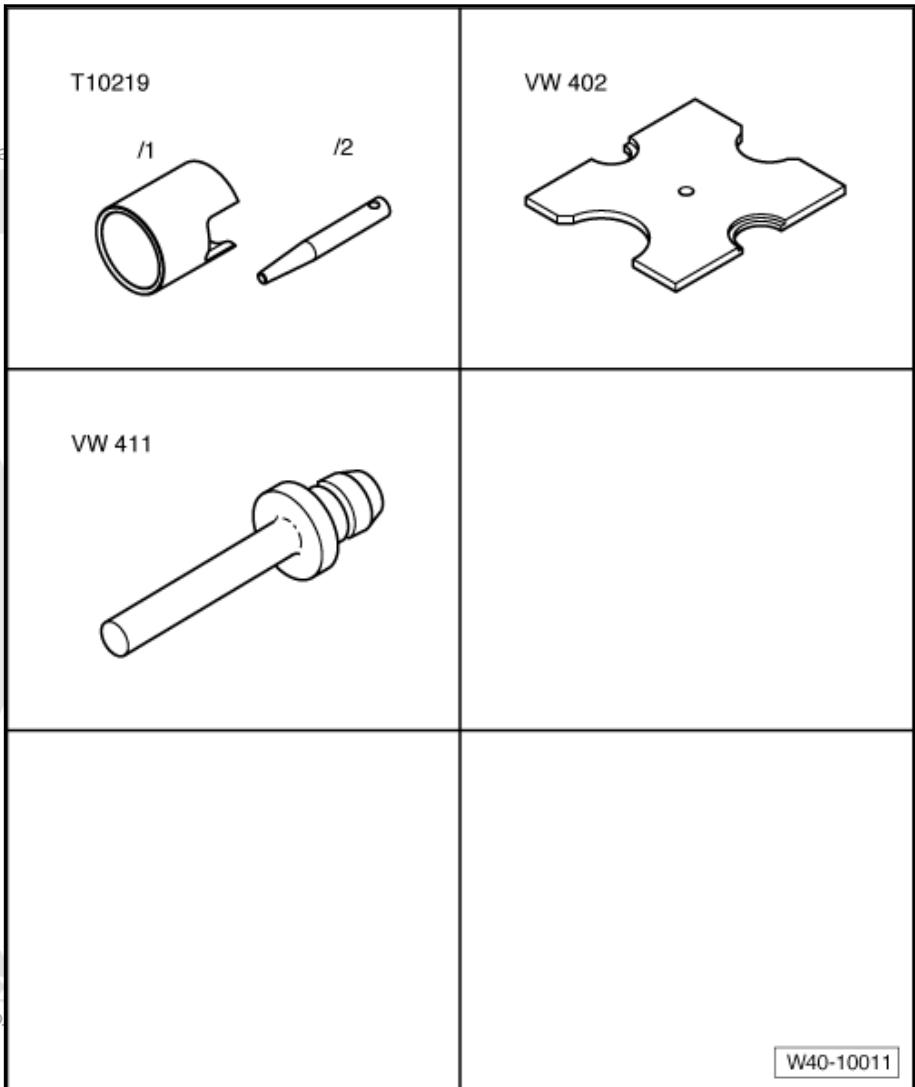
Bolt	Tightening Specification
M10 x 35 ◆ Use a new bolt	50 Nm + 90° additional turn
M10 x 75 ◆ Use a new bolt	50 Nm + 90° additional turn

3.14 Control Arm Bonded Rubber Bushing, Replacing



Special tools and workshop equipment required

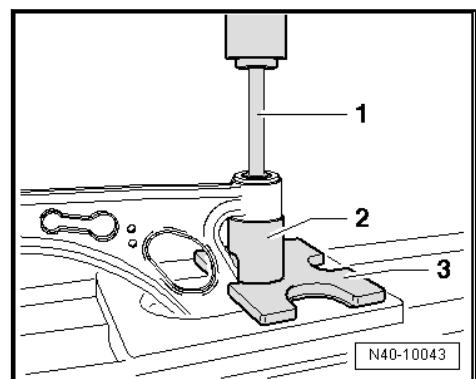
Only for private or commercial purposes, in part or in whole, is not permitted unless authorised by Volkswagen AG.



- ◆ Wishbone Rubber Mount Assembly Tool -Tube -T10219/1-
- ◆ Wishbone Rubber Mount Assembly Tool - Drift -T10219/2-
- ◆ Press Plate -VW 402-
- ◆ Press Piece - Rod -VW 411-

Bonded Rubber Bushing, Pressing Out

- Press out the bonded rubber bushings as shown.



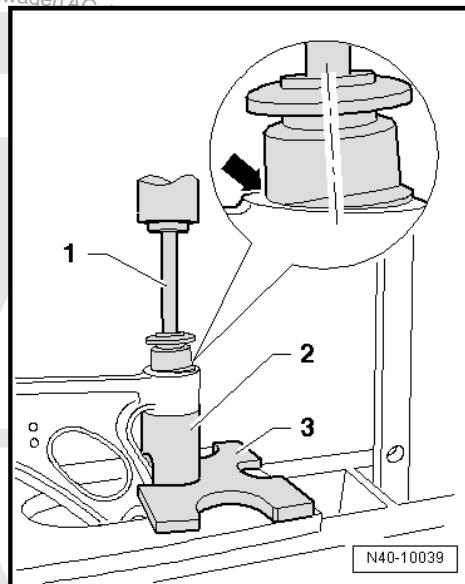


- 1 - Press Piece - Rod -VW 411-
- 2 - Wishbone Rubber Mount Assembly Tool -Tube - T10219/1-
- 3 - Press Plate -VW 402-

Bonded Rubber Bushing, Pressing In

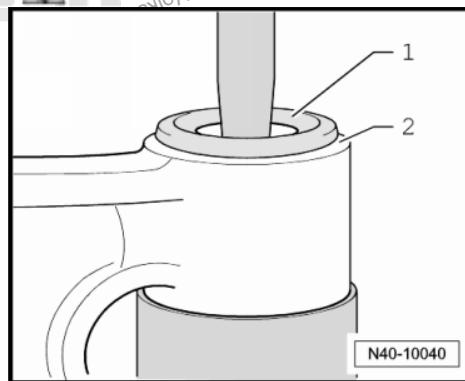
Bonded rubber bushing must be installed at an angle to prevent damaging it when pressing in. The bonded rubber bushing positions itself straight while pressing in.

- Apply Installation Lubricant -G 294 421 A1- onto the outside of the bonded rubber bushing.
- Place the bonded rubber bushing on at an angle (in direction of control arm); the lip -arrow- must slip into the hole as shown during this.

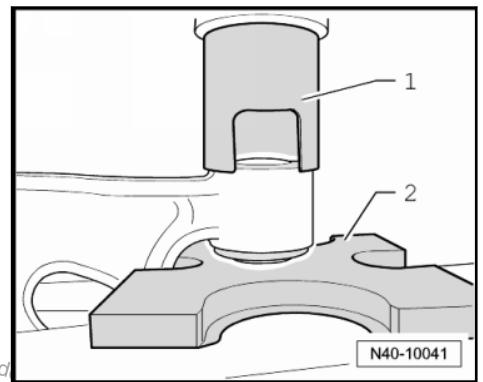


- 1 - Wishbone Rubber Mount Assembly Tool - Drift -T10219/2-
- 2 - Wishbone Rubber Mount Assembly Tool -Tube - T10219/1-
- 3 - Press Plate -VW 402-

- Press in the bonded rubber bushing until the core -1- and hole for the control arm -2- are on the same level.



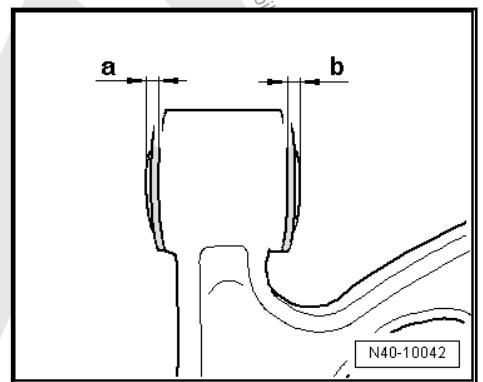
- Press the bearing back slightly in the control arm.



1 - Wishbone Rubber Mount Assembly Tool -Tube -
T10219/1-

2 - Press Plate -VW 402-

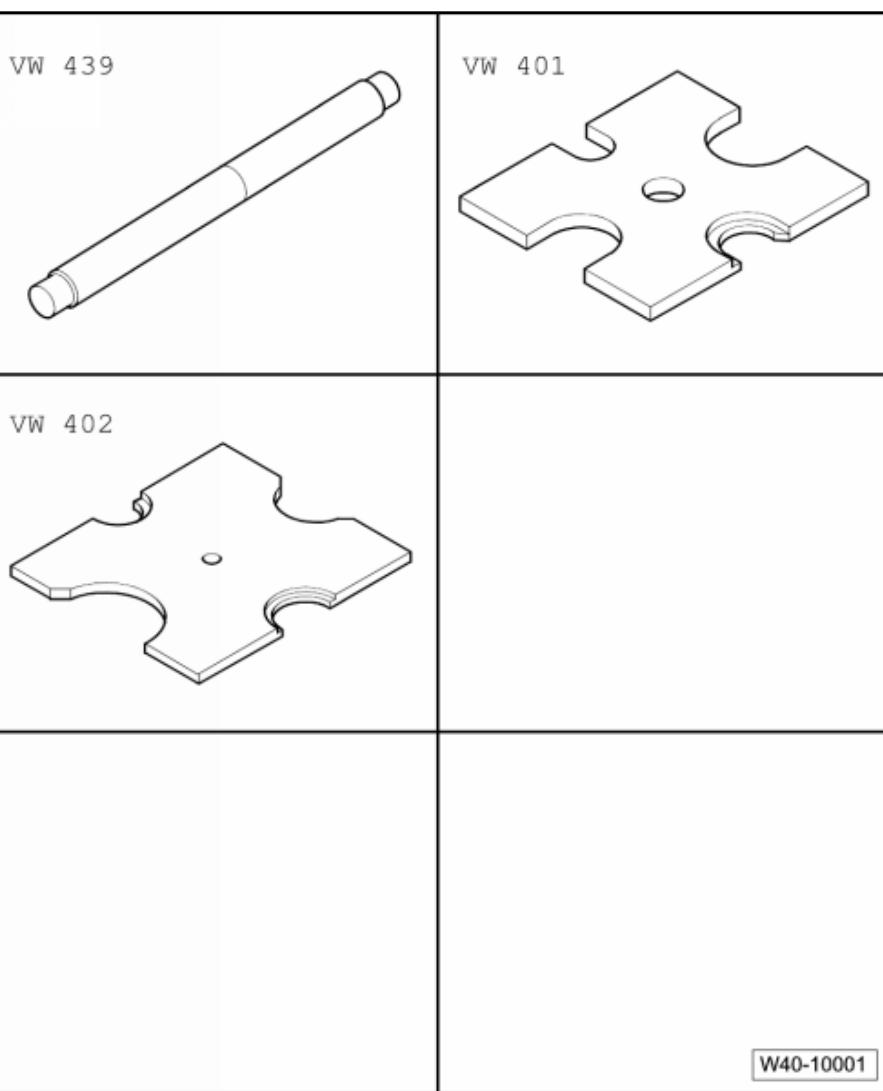
Dimensions -a- and -b- must be identical.



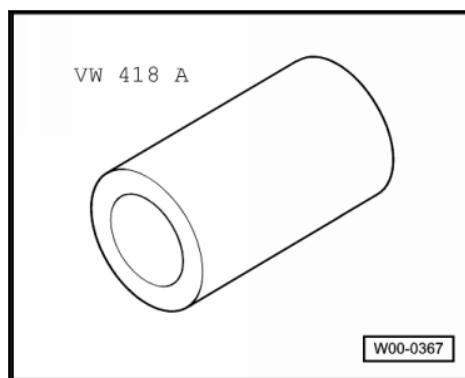
3.15 Mounting Bracket with Control Arm Bearing, Replacing



Special tools and workshop equipment required



- ◆ Press Piece - Guide Pin -VW 439-
- ◆ Press Plate -VW 401-
- ◆ Press Plate -VW 402-
- ◆ Press Piece - 31.5 mm -VW 418 A-



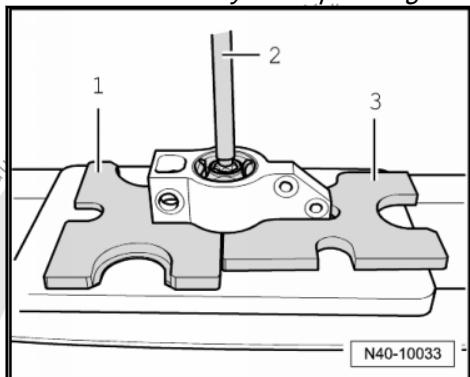
Pressing off the mounting bracket with the control arm bearing

Bonded rubber bushing is available as a replacement part only with the mounting bracket.

- Press the mounting bracket with bonded rubber bushing off the control arm.


Note

Hold control arm firmly while pressing out.

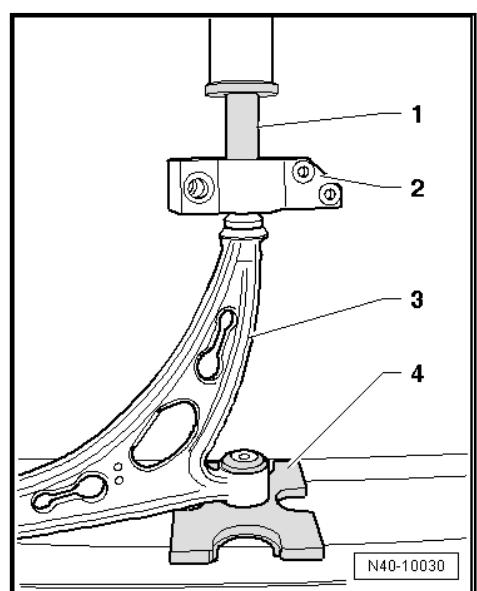


- 1 - Press Plate -VW 401-
- 2 - Press Piece - Guide Pin -VW 439-
- 3 - Press Plate -VW 402-

Pressing on the mounting bracket with the bearing on the control arm

- Thinly coat the control arm hex fitting with Installation Lubricant -G 294 421 A1- (1:20).

Carefully press the bearing onto control arm all the way.



- 1 - Press Piece - 31.5 mm -VW 418 A-
- 2 - Mounting Bracket with Bonded Rubber Bushing
- 3 - Control Arm
- 4 - Press Plate -VW 401-

3.16 Stabilizer Bar, Removing and Installing



Special tools and workshop equipment required

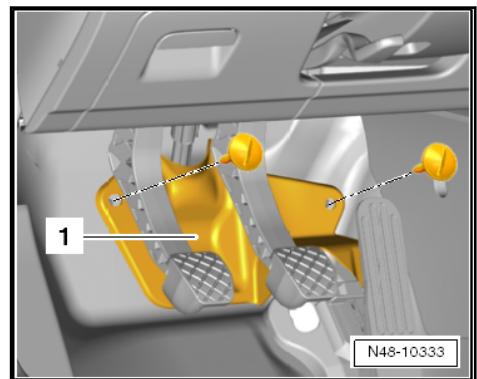
T10096	V.A.G 1332
V.A.G 1383	3287 A

W40-10002

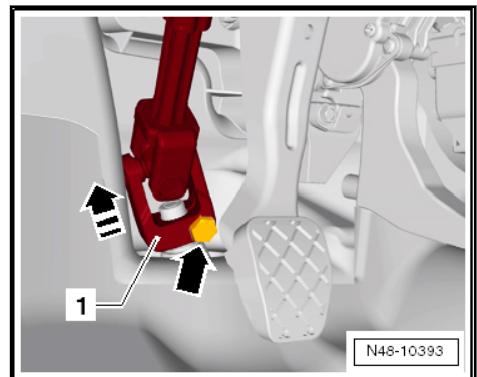
- ◆ Locating Pins -T10096-
- ◆ Torque Wrench, 40-200Nm -V.A.G 1332A-
- ◆ Engine and Gearbox Jack -VAS 6931-
- ◆ Puller - Ball Joint -3287 A-

Removing

- Remove the front wheels.
- Remove the footwell trim panel -1-.



- Remove the bolt -arrow- from the universal joint -1-, and then remove the universal joint in the -direction of the arrow-.



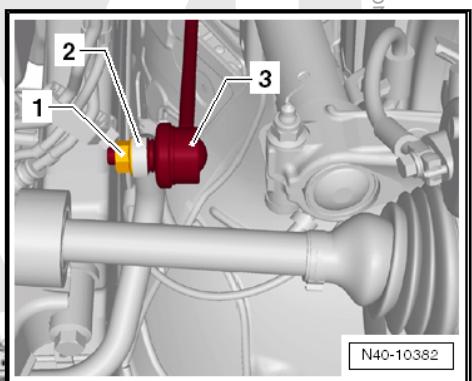
Caution

If the universal joint is separated from the steering gear, the following work cannot be performed:

- ◆ *Switching on the ignition*
- ◆ *Turning the steering gear*
- ◆ *Turning the steering column.*

These points must be observed since performing these actions could cause irreparable damage.

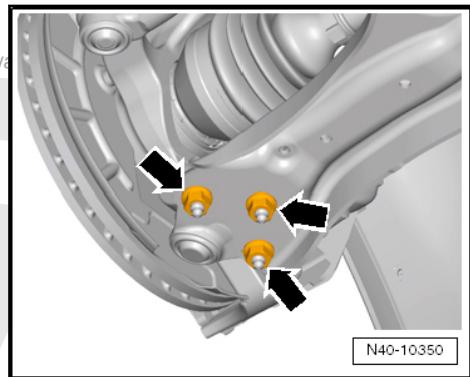
- Remove the lower noise insulation. Refer to ⇒ Rep. Gr. 50; Overview - Noise Insulation.
- Remove the right and left nuts -1- from the coupling rods -3-.



- Remove the coupling rods -3- from the stabilizer bar -2-.



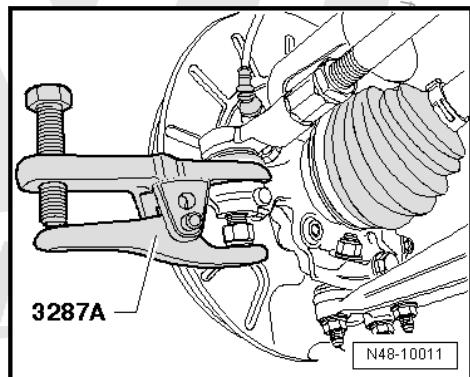
- Remove the nuts -arrows-.



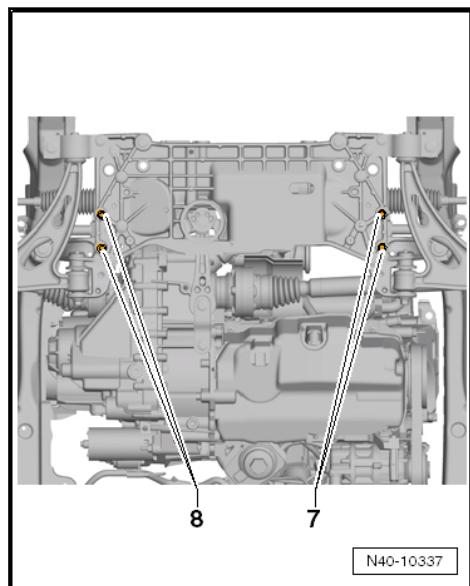
- Loosen the nut from the tie rod end on both sides but do not remove.

To protect the thread, screw the nut on the pin several turns.

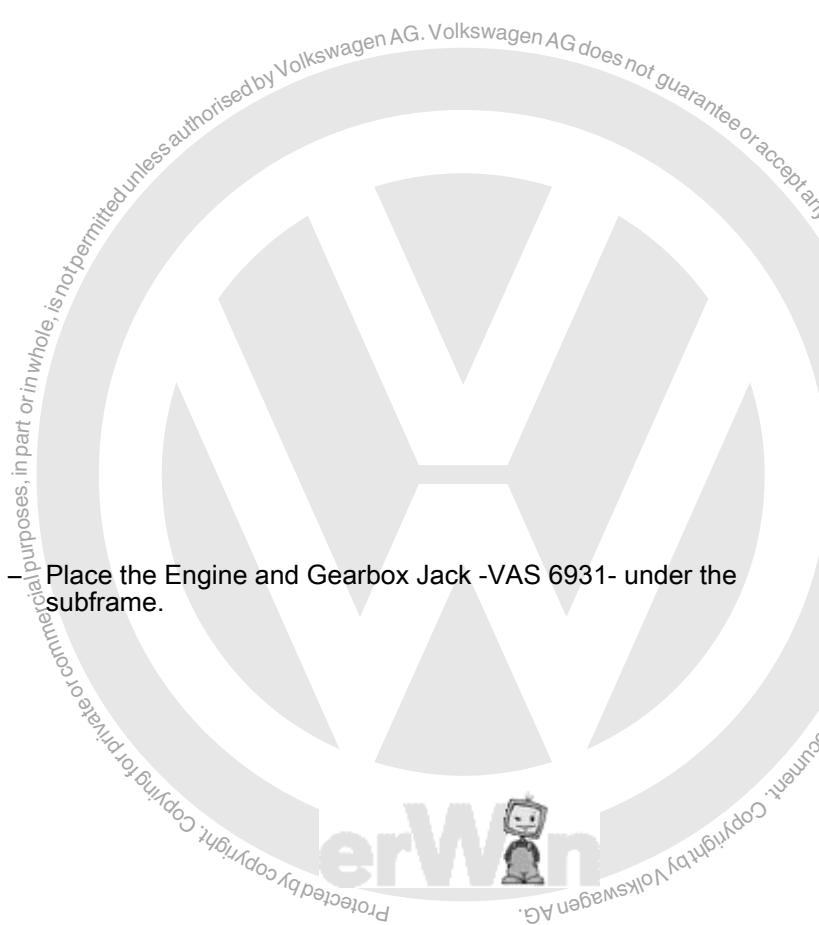
- Press the tie rod end off the wheel bearing housing using the Puller - Ball Joint -3287A-



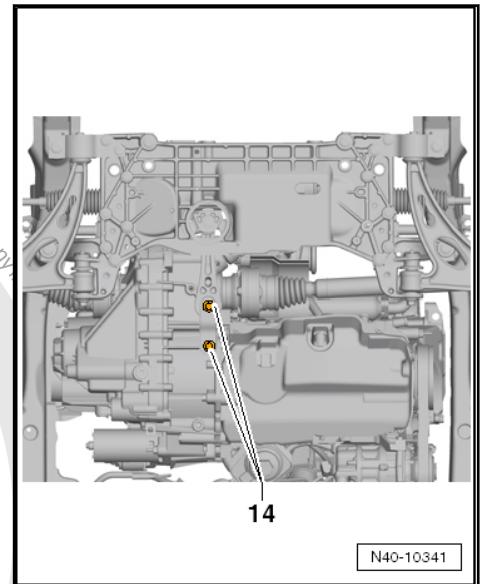
- Secure the subframe with brackets. Refer to [⇒ a3.5 nd Brackets, Securing](#), page 16 .
- Remove the stabilizer bar from the subframe -7- and -8-



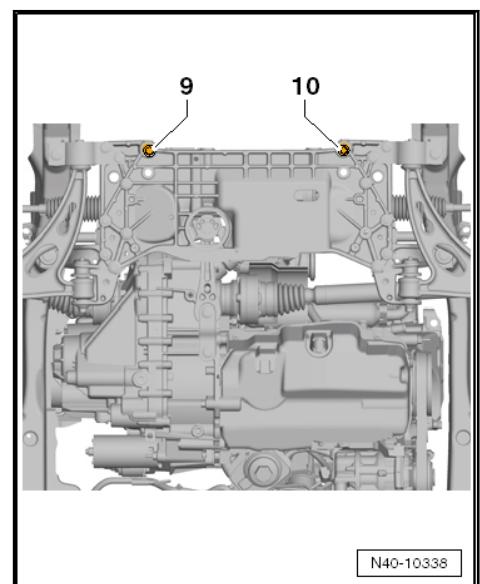
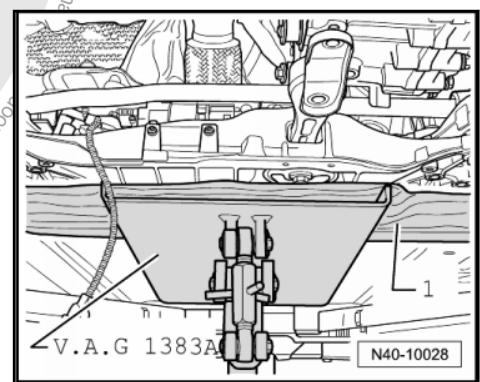
- Remove the bolts -14- and then remove the pendulum support from the transmission.



Place the Engine and Gearbox Jack -VAS 6931- under the subframe.

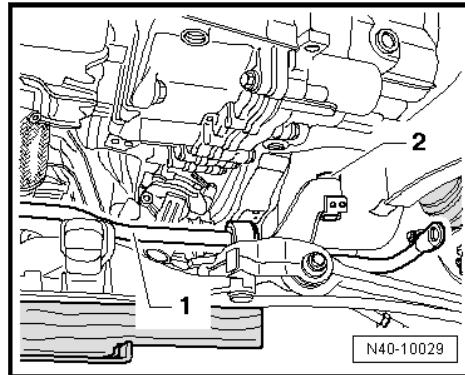


- Place, for example, a block of wood -1- between the Engine and Gearbox Jack -VAS 6931- and the subframe.
- Remove the bolts -9- and -10- and slightly lower the subframe. Observe the wires when doing this.





- Now lift stabilizer bar -1- toward the front over the bracket -2- and down from the subframe.



Installing

Install in reverse order of removal.



Note

- ◆ Coat the seal on the steering gear with lubricant such as soft soap before installing the steering gear.
- ◆ After attaching the steering gear to the drive axle, make sure that the seal on the steering gear rests on the mounting plate without kinks and seals the opening to the footwell correctly. Water leak and/or noises may be the result.
- ◆ Make sure sealing surfaces are clean.

- Install the lower noise insulation. Refer to ⇒ Rep. Gr. 50; Overview - Noise Insulation.

Install the front wheels and tighten. Refer to ⇒ [Mounting Tightening Specifications](#), page 315 .

Tightening Specifications

Component	Tightening Specification
Subframe to body ◆ Different versions ◆ Allocation. Refer to the ⇒ Electronic Parts Catalog (ETKA). ◆ Use new bolts.	◆ M12 x 1.5 x 100: 70 Nm + 90° ◆ M12 x 1.5 x 110: 70 Nm
Bracket to body ◆ Use new bolts.	70 Nm + 90°
Mounting bracket to body ◆ Use new bolts.	70 Nm + 90°
Subframe to bracket ◆ Use new bolts.	70 Nm + 90°
Control arm to cast-steel control arm ◆ Use new nuts	60 Nm
Control arm to steel panel or aluminum control arm ◆ Use new nuts	100 Nm



Component	Tightening Specification
Stabilizer bar to coupling rod ◆ Use a new nut ◆ Counterhold at joint pin inner multi-point fitting	65 Nm
Stabilizer bar to subframe ◆ Use new bolts	20 Nm + 90°
Control arm to bracket ◆ Use a new bolt ◆ Tighten bolts in curb weight position	70 Nm + 180°
Steering gear to subframe ◆ Use new bolts	50 Nm + 90°
Universal joint to steering gear ◆ Use a new bolt	30 Nm

Tightening specification, pendulum support to the transmission

Bolt	Tightening Specification
M10 x 35 ◆ Use a new bolt	50 Nm + 90° additional turn
M10 x 75 ◆ Use a new bolt	50 Nm + 90° additional turn

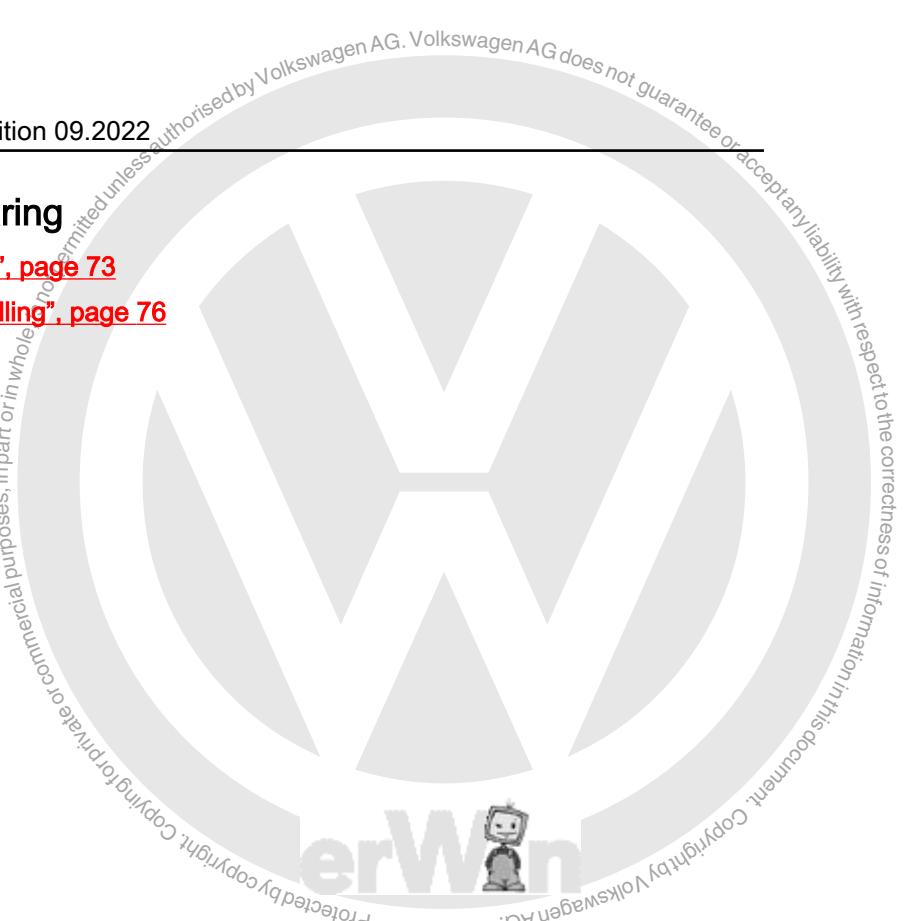
- After installing, perform the basic setting for the Steering Angle Sensor -G85- using the ⇒ Vehicle diagnostic tester.



4 Overview - Wheel Bearing

⇒ [B4.1 earing Unit, Removing and Installing", page 73](#)

⇒ [B4.2 earing Housing, Removing and Installing", page 76](#)



1 - Suspension Strut
2 - Tie Rod End
3 - Internal Multi-Point Bolt

- Bolt point must face the direction of travel

4 - Hex Socket Bolt

- 8 Nm

5 - Left Front ABS Wheel Speed Sensor -G47-/ Right Front ABS Wheel Speed Sensor -G45-

- Before inserting the speed sensor, clean the inner surface of the hole and coat with Grease -G 000 650-.

6 - Cover Plate
7 - Nut

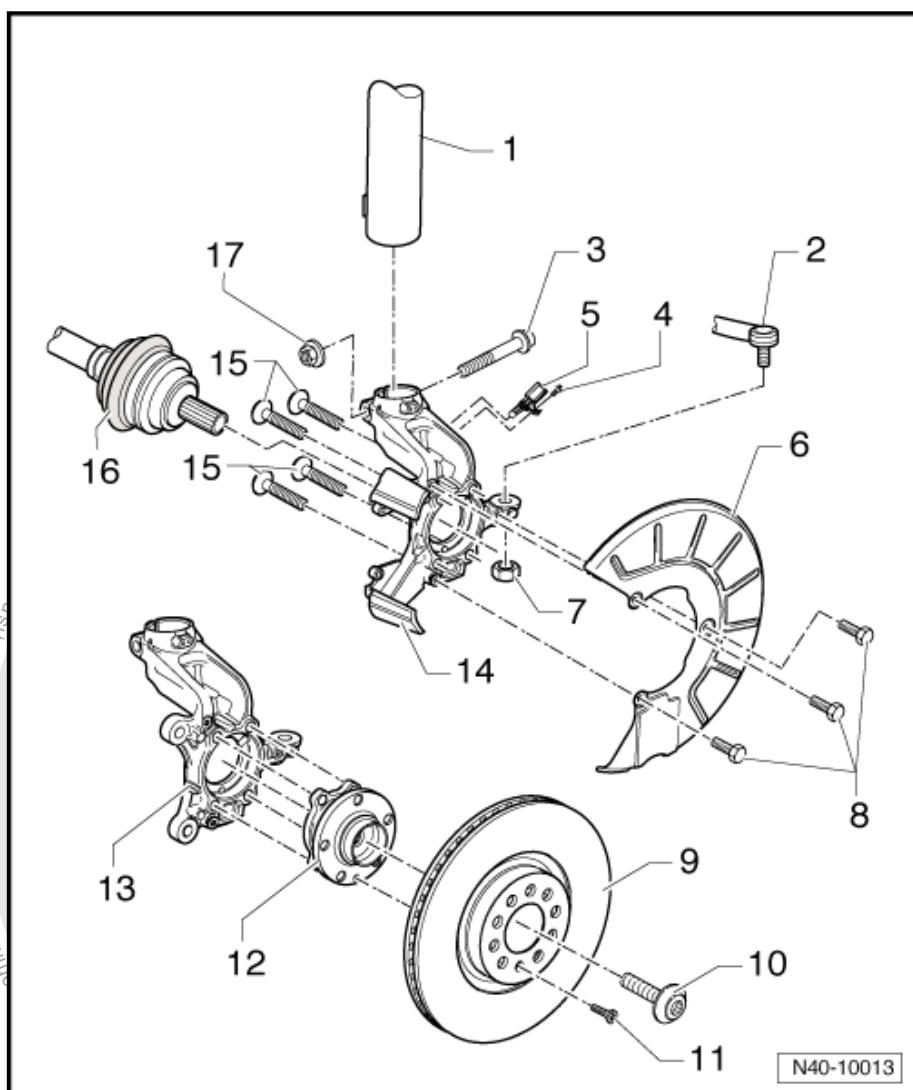
- 20 Nm + 90° additional turn
- Self-locking
- Always replace if removed

8 - Bolt

- 10 Nm

9 - Internally Vented Brake Rotor
10 - Bolt

- Different versions
- Allocation. Refer to the → Electronic Parts Catalog (ETKA).



N40-10013

WARNING

There are two types of twelve-point bolts, with and without ribs. Distinguishing characteristics. Refer to → Fig. “Difference between a twelve-point bolt with ribs and a twelve-point bolt without ribs”, page 72 .

When installing a twelve-point bolt, always check what type of twelve-point bolt is to be used.

Use the correct tightening specification for the bolt.

The tightening specification for a twelve-point bolt »with« ribs is 70 Nm + 90°. Refer to → B6.1 bolt with Ribs, Loosening and Tighten-

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ing, Drive Axle Threaded Connection", page 94

for loosening and tightening.

The tightening specification for a twelve-point bolt »without« ribs is 200 Nm + 180°. Refer to ➔ B6.2 oft without Ribs,

Loosening and Tightening, Drive Axle Threaded Connection", page 96

for loosening and tightening.

- Always replace if removed

11 - Bolt

- Tightening Specifications. Refer to ➔ Brake System; Rep. Gr. 46; Front Brakes, Servicing.

12 - Wheel Hub with Wheel Bearing

- The ABS sensor ring is installed in the wheel hub
- Different versions
- Allocation. Refer to the ➔ Electronic Parts Catalog (ETKA).

13 - Wheel Bearing Housing

- Removing and Installing. Refer to ➔ **B4.2 earing Housing, Removing and Installing", page 76**.
- With brake carrier bolted on
- If the wheel bearing housing is replaced, the vehicle must then be aligned. Refer to ➔ **A8 lignment", page 340**.
- Allocation. Refer to the ➔ Electronic Parts Catalog (ETKA).

14 - Wheel Bearing Housing

- Removing and Installing. Refer to ➔ **B4.2 earing Housing, Removing and Installing", page 76**.
- With integrated brake carrier
- If the wheel bearing housing is replaced, the vehicle must then be aligned. Refer to ➔ **A8 lignment", page 340**.
- Allocation. Refer to the ➔ Electronic Parts Catalog (ETKA).

15 - Internal Multi-Point Bolt

- 70 Nm + 90° additional turn
- Always replace if removed

16 - Drive Axle

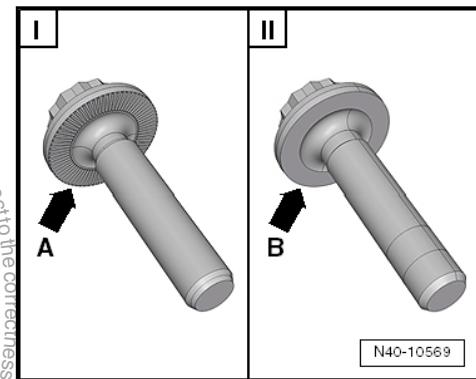
- Removing and Installing. Refer to ➔ **A6.3 xle with CV Joint, Removing and Installing", page 98**.

17 - Nut

- 70 Nm + 90° additional turn
- Self-locking
- Always replace if removed

Difference between a twelve-point bolt with ribs and a twelve-point bolt without ribs





The contact surfaces -arrow A- and -arrow B- are different on the two-point bolts.

- I - Twelve-Point Bolt with Ribs -arrow A-
- II - Twelve-Point Bolt without Ribs -arrow B-

4.1 Wheel Bearing Unit, Removing and Installing

Special tools and workshop equipment required

- ◆ Torque Wrench, 40-200Nm -V.A.G 1332A-



Removing

- Loosen the drive axle bolt on the wheel hub:
- ◆ Twelve-point bolt with ribs. Refer to [B6.1 olt with Ribs, Loosening and Tightening, Drive Axle Threaded Connection](#), page 94 .
- ◆ Twelve-point bolt without ribs. Refer to [B6.2 olt without Ribs, Loosening and Tightening, Drive Axle Threaded Connection](#), page 96 .



Caution

Do not load the wheel bearing if the wheel-side drive axle threaded connection is loose.

If the wheel bearings are under the load of the vehicle weight, the wheel bearing will be damaged. This reduces the service life of the wheel bearings.

The drive axle bolt may be loosened maximum 90° when the vehicle is standing on its wheels.

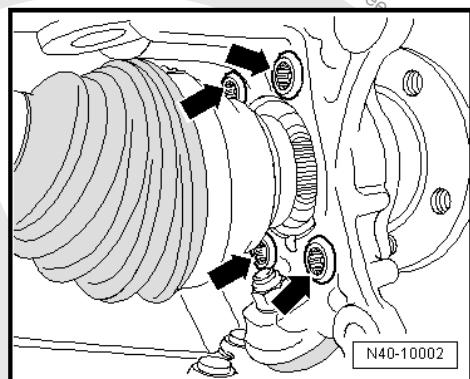
Vehicles without a drive axle must not be moved, otherwise the wheel bearing will be damaged. If a vehicle must be moved, be sure to note the following:

- ◆ *Install an outer joint in place of the drive axle.*
- ◆ *Tighten the outer joint to 120 Nm.*

- Remove the wheel.
- Remove the brake caliper and attach to the body with wire. Refer to ⇒ Brake System; Rep. Gr. 46; Front Brakes, Servicing.
- Remove the ABS speed sensor. Refer to ⇒ Brake System; Rep. Gr. 46; Front Wheel Brakes, Servicing.
- Remove the brake rotor.

Only vehicles with a VL 90/VL 100 drive axle.

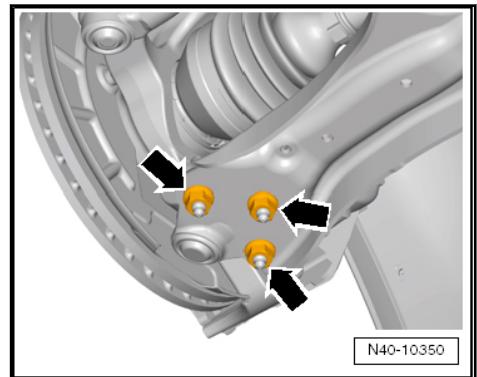
- Press the drive axle out of the wheel hub as far as possible (in the direction of the transmission).
- Remove the bolts -arrows-.



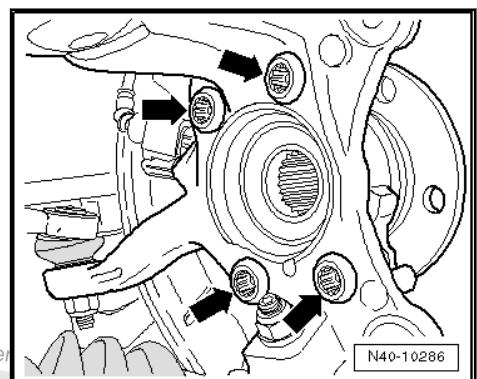
- Remove the wheel bearing unit from wheel bearing housing.

Continuation for all vehicles

- Remove the nuts -arrows-.



- Remove the control arm from the ball joint.
- Pull the drive axle out of the wheel hub.
- Remove the bolts -arrows-.



- Remove the wheel bearing unit from wheel bearing housing.

Installing

Install in reverse order of removal.

- Install the brake caliper. Refer to ⇒ Brake System; Rep. Gr. 46; Front Brakes, Servicing.
- Tighten the drive axle bolt to the wheel hub:
 - ◆ Twelve-point bolt with ribs. Refer to ⇒ [B6.1 olt with Ribs, Loosening and Tightening, Drive Axle Threaded Connection](#), page 94 .
 - ◆ Twelve-point bolt without ribs. Refer to ⇒ [B6.2 olt without Ribs, Loosening and Tightening, Drive Axle Threaded Connection](#), page 96 .



Caution

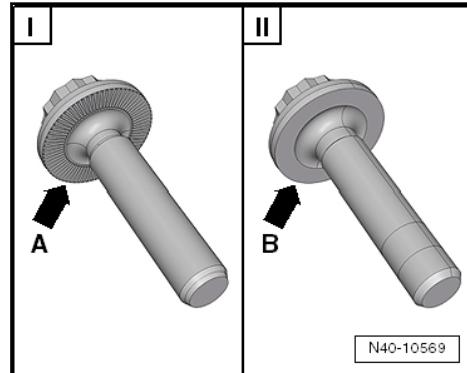
The vehicle must not be resting on the wheels when doing so.

When the bolt is loose, the wheel bearing can be damaged by the weight of the vehicle.





Difference between a twelve-point bolt with ribs and a twelve-point bolt without ribs



The contact surfaces -arrow A- and -arrow B- are different on the two-point bolts.

I - Twelve-Point Bolt with Ribs -arrow A-

II - Twelve-Point Bolt without Ribs -arrow B-

- Install the ABS speed sensor. Refer to [Brake System; Rep. Gr. 46; Front Brakes, Servicing](#).
- Install the wheel and tighten. Refer to [M2 Counting Tightening Specifications](#), page 315 .

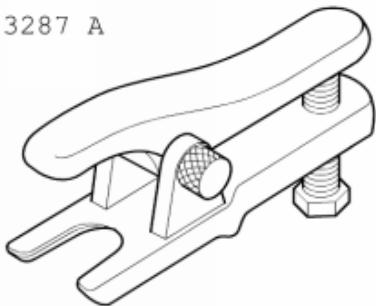
Tightening Specifications

Component	Tightening Specification
Drive axle to wheel hub "twelve-point bolt with ribs" ◆ Use a new bolt	70 Nm + 90°
Drive axle to wheel hub "twelve-point bolt without ribs" ◆ Use a new bolt	200 Nm + 180°
Wheel hub with wheel bearing to wheel bearing housing ◆ Use new bolts.	70 Nm + 90°
Control arm to cast-steel control arm ◆ Use new nuts	60 Nm
Control arm to steel panel or aluminum control arm ◆ Use new nuts	100 Nm

4.2 Wheel Bearing Housing, Removing and Installing

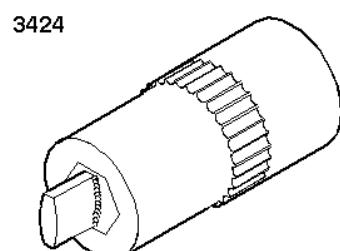


Special tools and workshop equipment required

 3287 A	V.A.G 1332
 V.A.G 1383 A	V.A.G 1756

W40-10000

- ◆ Puller - Ball Joint -3287A-
- ◆ Torque Wrench, 40-200Nm -V.A.G 1332A-
- ◆ Engine and Gearbox Jack -VAS 6931-
- ◆ Digital Torque Wrench -V.A.G 1756A-
- ◆ Spreader Tool -3424-



W00-0413

Removing

- Loosen the drive axle bolt on the wheel hub:



- ◆ Twelve-point bolt with ribs. Refer to [⇒ B6.1 olt with Ribs, Loosening and Tightening, Drive Axle Threaded Connection](#), page 94 .
- ◆ Twelve-point bolt without ribs. Refer to [⇒ B6.2 olt without Ribs, Loosening and Tightening, Drive Axle Threaded Connection](#), page 96 .



Caution

Do not load the wheel bearing if the wheel-side drive axle threaded connection is loose.

If the wheel bearings are under the load of the vehicle weight, the wheel bearing will be damaged. This reduces the service life of the wheel bearings.

The drive axle bolt may be loosened maximum 90° when the vehicle is standing on its wheels.

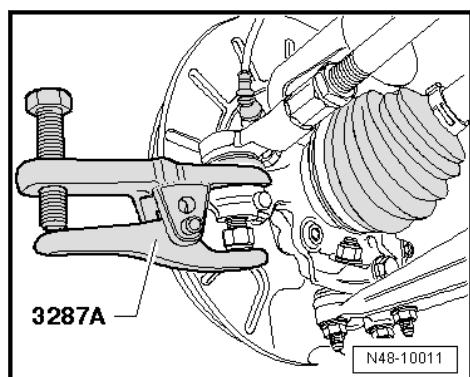
Vehicles without a drive axle must not be moved, otherwise the wheel bearing will be damaged. If a vehicle must be moved, be sure to note the following:

- ◆ *Install an outer joint in place of the drive axle.*
- ◆ *Tighten the outer joint to 120 Nm.*

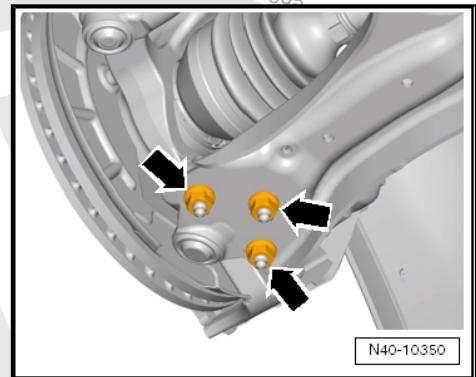
- Remove the wheel.
- Remove the brake caliper and attach to the body with wire. Refer to [⇒ Brake System; Rep. Gr. 46; Front Brakes, Servicing](#).
- Remove the ABS speed sensor. Refer to [⇒ Brake System; Rep. Gr. 46; Front Wheel Brakes, Servicing](#).
- Remove the brake rotor.
- Now remove the cover plate from the wheel bearing housing.
- Loosen the nut of the tie rod end, but do not remove yet.

To protect the thread, screw the nut on the pin several turns.

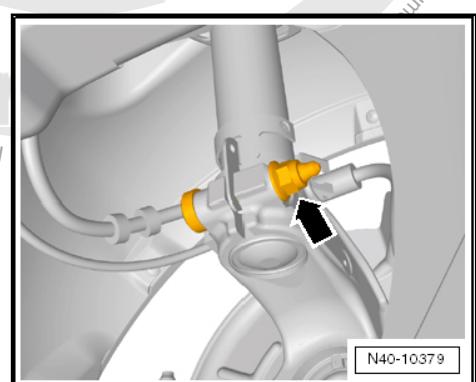
- Press off tie rod end from wheel bearing housing with Puller - Ball Joint -3287A- and then remove nut.



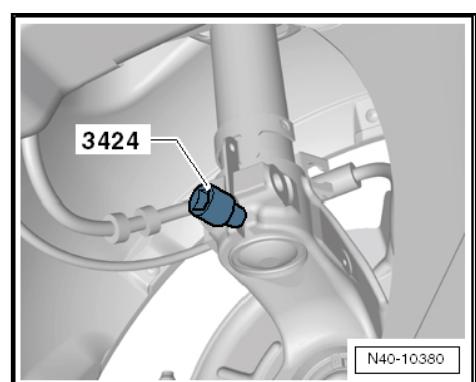
- Loosen the nuts -arrows-.



- Remove the control arm from the ball joint.
- Remove the drive axle outer joint from the wheel hub.
- Secure the drive axle to the body using a wire.
- Now place the Engine and Gearbox Jack -VAS 6931- under the wheel bearing housing.
- Remove the threaded connection on the wheel bearing housing/suspension strut -arrow-.



- Insert Spreader Tool -3424- into the wheel bearing housing.



- Turn the ratchet 90° and remove it from the Spreader Tool -3424-.
- Remove the wheel bearing housing from the suspension strut.



Note

If the wheel bearing housing is being replaced, then the ball joint must also be replaced. New nuts must be used.



Installing

Install in reverse order of removal. Note the following:

- Tighten the drive axle bolt to the wheel hub:
- ◆ Twelve-point bolt with ribs. Refer to [⇒ B6.1 Bolt with Ribs, Loosening and Tightening, Drive Axle Threaded Connection](#), page 94 .
- ◆ Twelve-point bolt without ribs. Refer to [⇒ B6.2 Bolt without Ribs, Loosening and Tightening, Drive Axle Threaded Connection](#), page 96 .

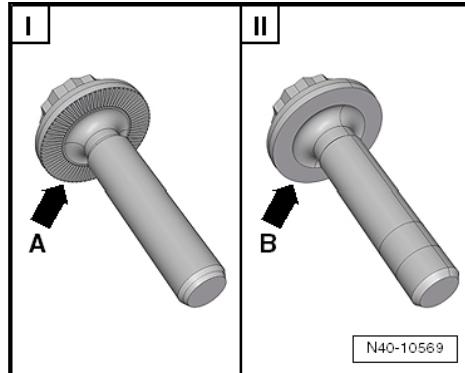


Caution

The vehicle must not be resting on the wheels when doing so.

When the bolt is loose, the wheel bearing can be damaged by the weight of the vehicle.

Difference between a twelve-point bolt with ribs and a twelve-point bolt without ribs



The contact surfaces -arrow A- and -arrow B- are different on the two-point bolts.

I - Twelve-Point Bolt with Ribs -arrow A-

II - Twelve-Point Bolt without Ribs -arrow B-

If the wheel bearing housing was replaced, the wheels must be aligned. Refer to [⇒ A8 Alignment](#), page 340 .

- Install the wheel and tighten. Refer to [⇒ M2 Counting Tightening Specifications](#), page 315 .

Tightening Specifications

Component	Tightening Specification
Suspension strut to wheel bearing housing ◆ Use a new nut	70 Nm + 90°
Control arm to cast-steel control arm ◆ Use new nuts	60 Nm
Control arm to steel panel or aluminum control arm ◆ Use new nuts	100 Nm
Tie rod end to wheel bearing housing ◆ Use a new nut	20 Nm + 90°



Component	Tightening Specification
Drive axle to wheel hub "twelve-point bolt with ribs" ◆ Use a new bolt	70 Nm + 90°
Drive axle to wheel hub "twelve-point bolt without ribs" ◆ Use a new bolt	200 Nm +180°





5 Overview - Suspension Strut

⇒ [S5.1 strut, Removing and Installing", page 82](#)

⇒ [S5.2 strut, Servicing", page 90](#)

1 - Shock Absorber

- Can be replaced individually
- Allocation. Refer to the
⇒ Electronic Parts Catalog (ETKA).

2 - Stop Buffer

3 - Protective Cover

4 - Coil Spring

- Removing and Installing. Refer to [page 91](#)
- Note the color code
- Allocation. Refer to the
⇒ Electronic Parts Catalog (ETKA).

Spring allocation using PR number
These numbers can be found on vehicle data plate.

- Surface of spring coil may not be damaged

5 - Deep-Groove Ball Bearing

6 - Strut Mount

- Note the installation position. Refer to [page 87](#).

7 - Nut

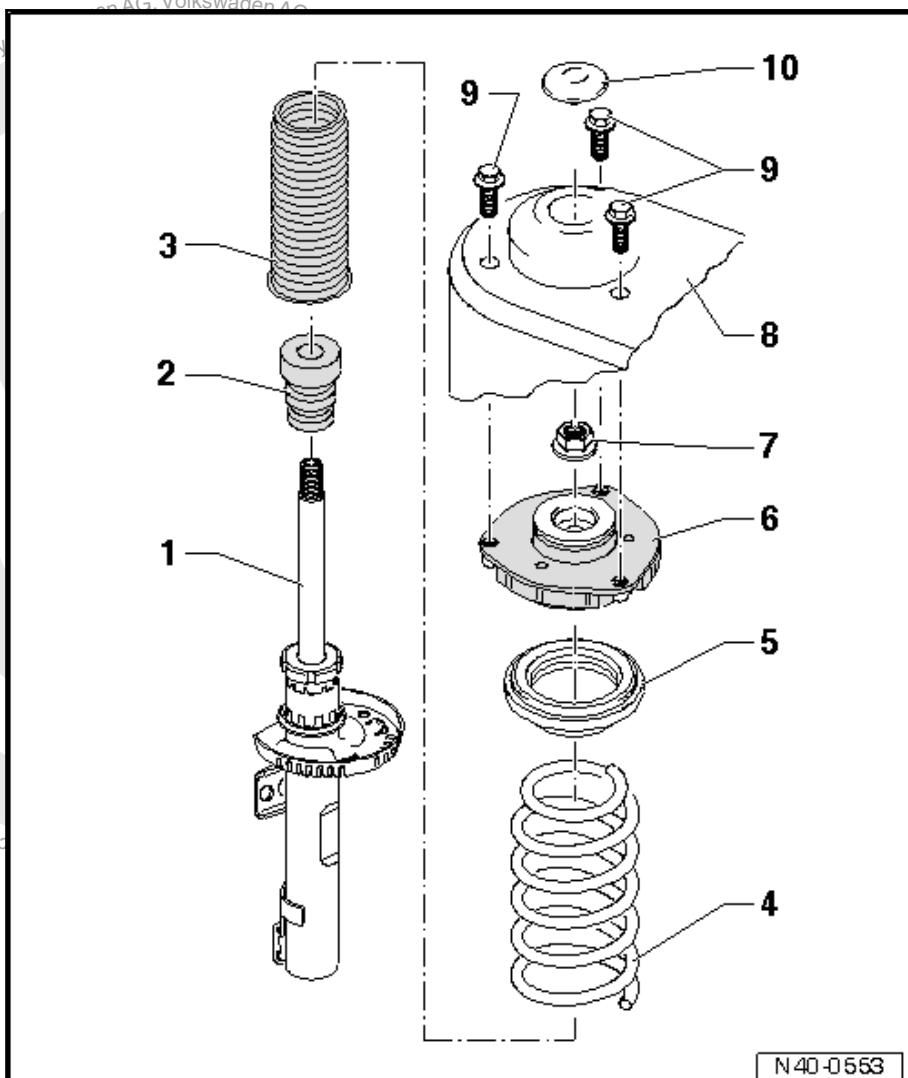
- 60 Nm
- Self-locking
- Always replace if removed

8 - Suspension Strut Tower

9 - Bolt

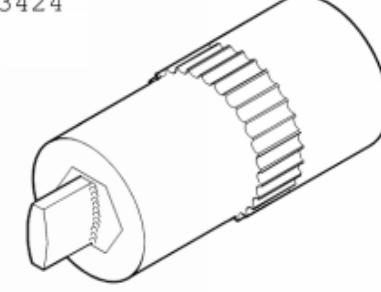
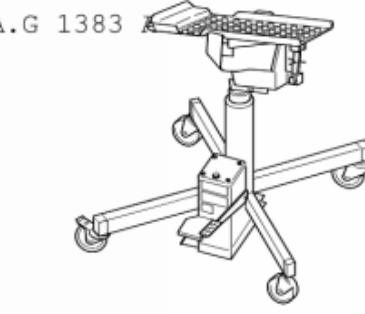
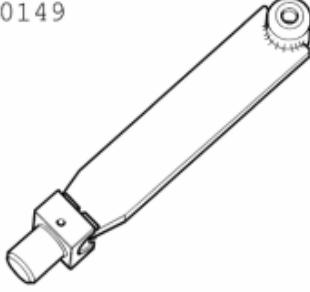
- 15 Nm + 90° Additional Turn
- Always replace if removed

10 - Protective Cap



5.1 Suspension Strut, Removing and Installing

Special tools and workshop equipment required

 <p>3424</p>	<p>V.A.G 1332</p> 
<p>V.A.G 1383</p> 	<p>T10149</p> 

W40-10003

- ◆ Torque Wrench, 40-200Nm -V.A.G 1332A-
- ◆ Spreader Tool -3424-
- ◆ Engine and Gearbox Jack -VAS 6931-
- ◆ Engine/Gearbox Jack Adapter - Wheel Hub Support - T10149-

Removing

- Loosen the drive axle bolt on the wheel hub:
- ◆ Twelve-point bolt with ribs. Refer to [⇒ B6.1 olt with Ribs, Loosening and Tightening, Drive Axle Threaded Connection](#), page 94 .
- ◆ Twelve-point bolt without ribs. Refer to [⇒ B6.2 olt without Ribs, Loosening and Tightening, Drive Axle Threaded Connection](#), page 96 .



Caution

Do not load the wheel bearing if the wheel-side drive axle threaded connection is loose.

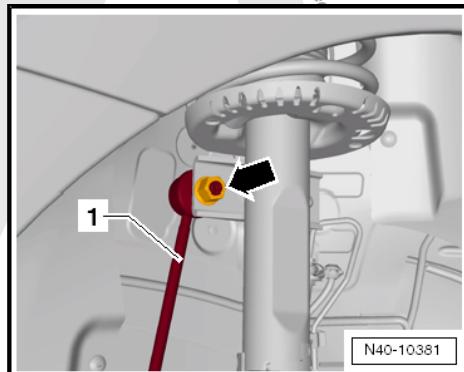
If the wheel bearings are under the load of the vehicle weight, the wheel bearing will be damaged. This reduces the service life of the wheel bearings.

The drive axle bolt may be loosened maximum 90° when the vehicle is standing on its wheels.

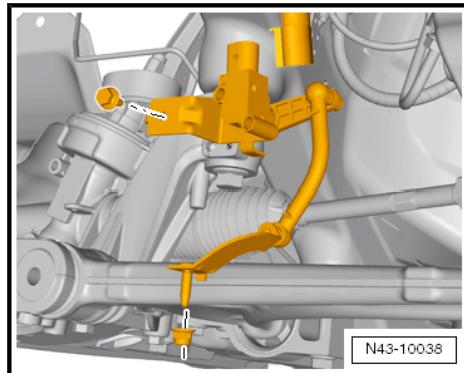
Vehicles without a drive axle must not be moved, otherwise the wheel bearing will be damaged. If a vehicle must be moved, be sure to note the following:

- ◆ *Install an outer joint in place of the drive axle.*
- ◆ *Tighten the outer joint to 120 Nm.*

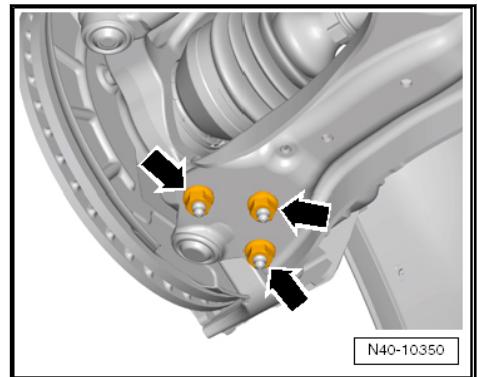
- Remove the wheel.
- Remove the coupling rod nut -arrow- from the suspension strut -1-.



- Disengage the wire for the wheel speed sensor from the suspension strut.
- Remove the level control system sensor from the control arm.



- Remove the nuts -arrows-.



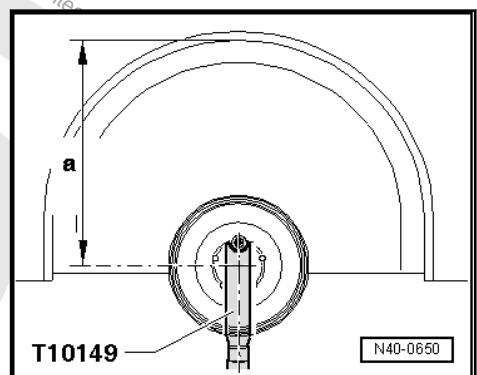
- Remove the wheel bearing housing with the ball joint from the control arm.
- Remove the drive axle outer joint from the wheel hub.
- Secure the drive axle to the body using a wire.



Caution

The drive axle must not hang down, otherwise the inner joint will be damaged by over bending.

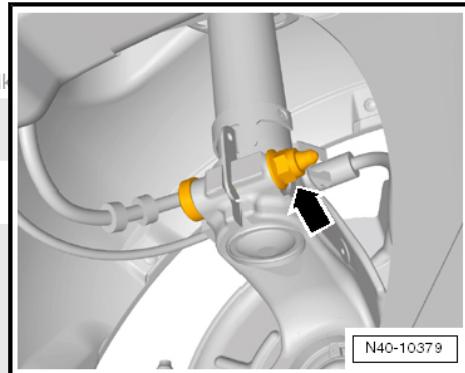
- Bolt the ball joint to the control arm again.
- Secure the Engine and Gearbox Jack -VAS 6931- using the Engine/Gearbox Jack Adapter -Wheel Hub Support -T10149- to the wheel hub with a wheel bolt.



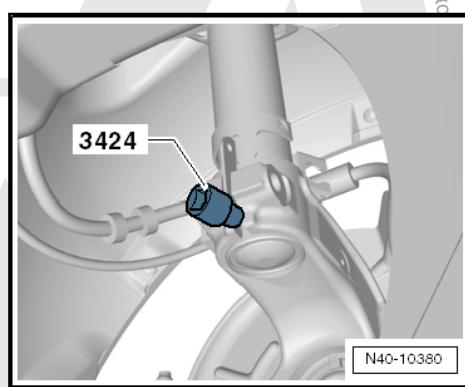
WARNING

- ◆ *Do not lift or lower the vehicle when the Engine/Gearbox Jack -VAS 6931- is under the vehicle. The vehicle could slip off the hoist.*
- ◆ *Do not leave the Engine and Gearbox Jack -VAS 6931- under the vehicle any longer than necessary.*

- Disconnect the threaded connection for the wheel bearing housing/suspension strut -arrow-



- Insert Spreader Tool -3424- into the wheel bearing housing.



- Turn the ratchet 90° and remove it from the Spreader Tool -3424-.
- Press the brake rotor toward the suspension strut by hand.

Otherwise, the shock absorber tube may be tilted in the wheel bearing housing hole.

- Remove the wheel bearing housing downward from the shock absorber tube and lower it using the Engine and Gearbox Jack -VAS 6931- until the shock absorber tube hangs freely.
- Tightly tie the wheel bearing housing to the bracket/sub-frame with wire.
- Remove the Engine and Gearbox Jack -VAS 6931- from under the wheel bearing housing.



WARNING

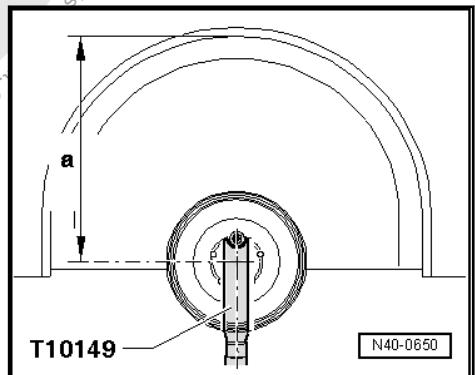
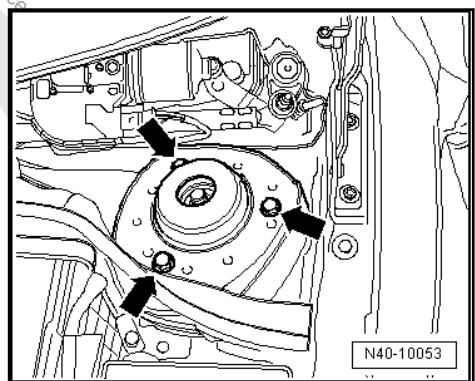
- ◆ *Do not leave the Engine and Gearbox Jack -VAS 6931- under the vehicle any longer than necessary.*

- Remove the wiper arms. Refer to ⇒ Rep. Gr. 92; Windshield Washing System; Wiper Arms, Removing and Installing.
- Remove the plenum chamber cover.
- Remove the hex bolts -arrows- for the upper shock absorber mount and remove the suspension strut.



Installing

- Secure the Engine and Gearbox Jack -VAS 6931- using the Engine/Gearbox Jack Adapter - Wheel Hub Support - T10149- to the wheel hub with a wheel bolt.

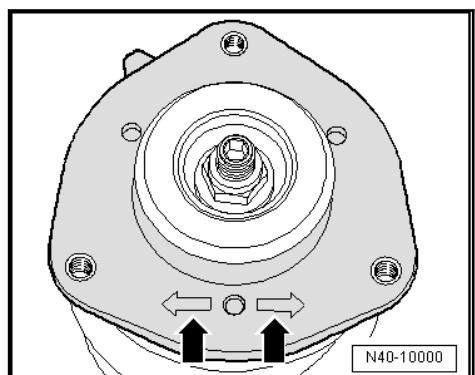


- Attach the suspension strut to the wheel bearing housing and secure the suspension strut using an internal multi-point bolt and a new nut.

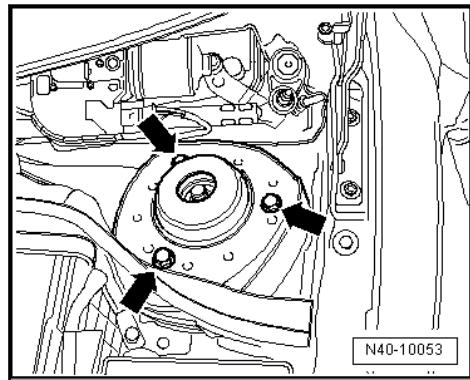
The point of the internal multi-point bolt must face the direction of travel.

- Remove the Spreader Tool -3424-.

One of the two markings -arrows- on the spring plate must point in the direction of travel.

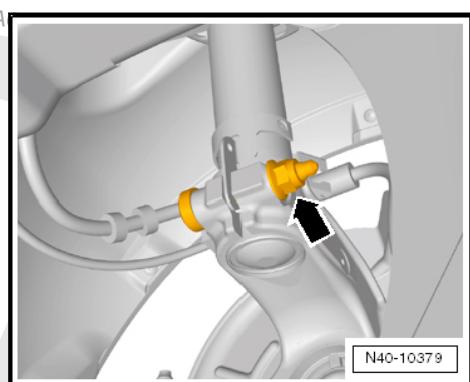


- Remove the wire on the wheel bearing housing.
- Carefully lift the wheel bearing housing using the transmission jack enough so that the suspension strut/strut tower bolts -arrows- can be installed.

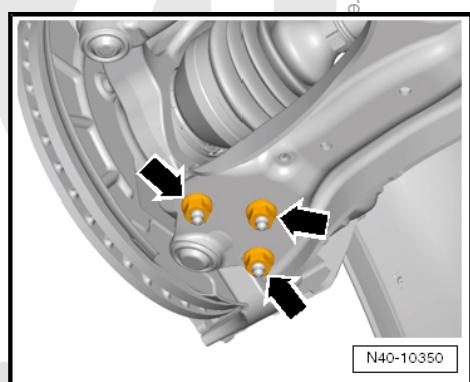


Use a ladder to install the bolts if necessary; for example, the Step Ladder -VAS 5085-.

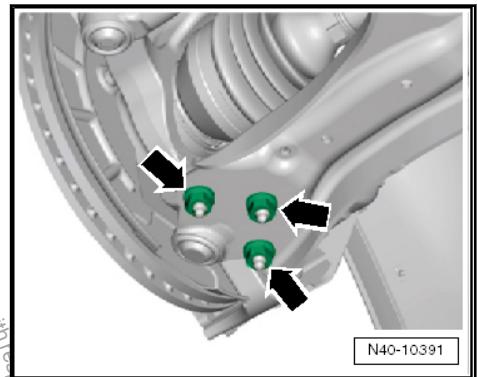
- Tighten the hex bolts for the upper shock absorber mount -arrows-.
- Remove the Engine/Gearbox Jack Adapter - Wheel Hub Support -T10149-.
- Tighten the threaded connection on the wheel bearing housing/suspension strut -arrow-.



- Remove the nuts -arrows-.



- Insert the drive axle into the wheel hub.
- Insert the wheel bearing housing with the ball joint into the control arm.
- Attach the ball joint to the control arm -arrows-.



N40-10391



Note

Make sure the ball joint boot is not damaged or twisted.

- Tighten the drive axle bolt to the wheel hub:
- ◆ Twelve-point bolt with ribs. Refer to [⇒ B6.1 olt with Ribs, Loosening and Tightening, Drive Axle Threaded Connection](#), page 94 .
- ◆ Twelve-point bolt without ribs. Refer to [⇒ B6.2 olt without Ribs, Loosening and Tightening, Drive Axle Threaded Connection](#), page 96 .

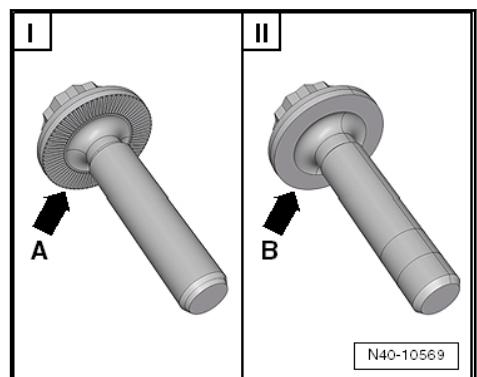


Caution

The vehicle must not be resting on the wheels when doing so.

When the bolt is loose, the wheel bearing can be damaged by the weight of the vehicle.

Difference between a twelve-point bolt with ribs and a twelve-point bolt without ribs



N40-10569

The contact surfaces -arrow A- and -arrow B- are different on the two-point bolts.

- I - Twelve-Point Bolt with Ribs -arrow A-
- II - Twelve-Point Bolt without Ribs -arrow B-
- Install the plenum chamber cover.
- Install the wiper arms. Refer to ⇒ Rep. Gr. 92; Windshield Washing System; Wiper Arms, Removing and Installing.



Further installation is performed in reverse order of the removal.

- Install the wheel and tighten. Refer to [M2 Counting Tightening Specifications](#), page 315 .

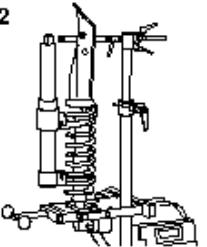
Tightening Specifications

Component	Tightening Specification
Suspension strut to wheel bearing housing ◆ Use a new nut	70 Nm + 90°
Suspension strut to body (suspension strut tower) ◆ Use new bolts.	15 Nm + 90°
Control arm to cast-steel control arm ◆ Use new nuts	60 Nm
Control arm to steel panel or aluminum control arm ◆ Use new nuts	100 Nm
Coupling rod to suspension strut ◆ Use a new nut ◆ Counterhold at joint pin inner multi-point fitting	65 Nm
Drive axle to wheel hub "twelve-point bolt with ribs" ◆ Use a new bolt	70 Nm + 90°
Drive axle to wheel hub "twelve-point bolt without ribs" ◆ Use a new bolt	200 Nm + 180°

5.2 Suspension Strut, Servicing



Special tools and workshop equipment required

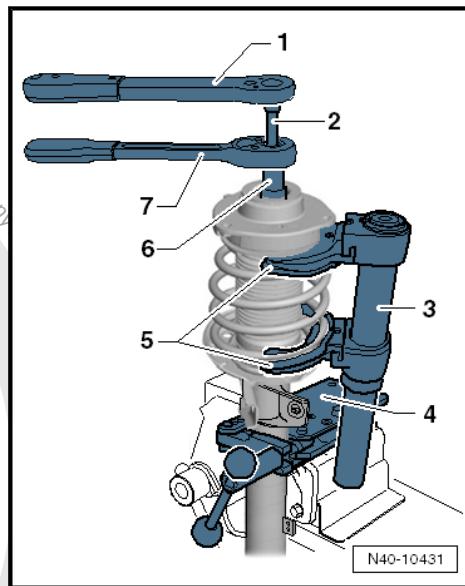
V.A.G 1332 	V.A.G 1752 
T 10001 	
	WV40-0119

- ◆ Torque Wrench, 40-200Nm -V.A.G 1332A-
- ◆ Spring Compressor Kit - Spring Tensioner -V.A.G 1752/1-
- ◆ Spring Compressor Kit - Strut Clamping Block -V.A.G 1752/20-
- ◆ Spring Compressor Kit - Spring Retainer w/Inserts -V.A.G 1752/5-
- ◆ Shock Absorber Set -T10001-
- ◆ Commercially Available Ratchet

- Remove the suspension strut. Refer to [page 83](#).

Coil Spring, Removing

- Clamp the Spring Compressor Kit - Strut Clamping Block -V.A.G 1752/20- -4- in a vise.



- Tighten the suspension strut in the Spring Compressor Kit - Strut Clamping Block -V.A.G 1752/20- -4-.
- Pretension the coil spring using the Spring Compressor Kit -Spring Tensioner -V.A.G 1752/1- until the upper deep-groove ball bearing is free.

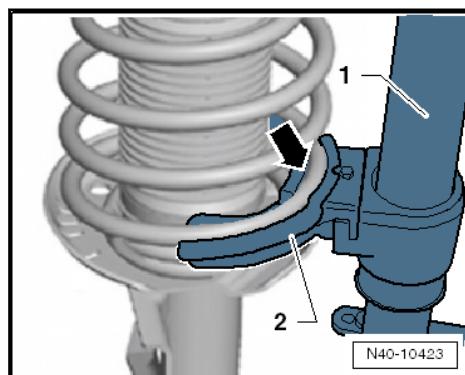
- 1 - Torque-Wrench, 40-200Nm -V.A.G 1332A-
- 2 - Shock Absorber Set - Extension SW7 -T10001/8-
- 3 - Spring Compressor Kit - Spring Tensioner -V.A.G 1752/1-
- 4 - Spring Compressor Kit - Strut Clamping Block -V.A.G 1752/20-
- 5 - Spring Compressor Kit - Spring Retainer w/Inserts -V.A.G 1752/4-
- 6 - Shock Absorber Set - Socket -T10001/5-
- 7 - Shock Absorber Set - Reversible Ratchet -T10001/11-



WARNING

First pre-load the spring so that the tension is relieved on upper spring plate!

- Make sure the coil spring is seated correctly -arrow- in the Spring Retainer - V.A.G 1752/4- -2-.



- 1 - Spring Compressor Kit - Spring Tensioner -V.A.G 1752/1-



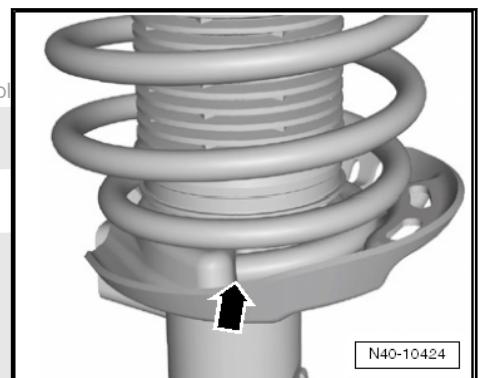
2 - Spring Compressor Kit - Spring Retainer w/Inserts -V.A.G 1752/4-

- Remove the hex nut from the piston rod.
- Remove the individual components of the suspension strut and coil spring with the Spring Compressor Kit - Spring Tensioner -V.A.G 1752/1-.

Coil Spring, Installing

- Place the coil spring on the lower spring washer using the Spring Compressor Kit - Spring Tensioner -V.A.G 1752/1-.

The end of the spring coil must rest against the stop -arrow-.



N40-10424

- Tighten the new hex nut to the piston rod.
- Relieve the tension on the Spring Compressor Kit - Spring Tensioner -V.A.G 1752/1- and remove it from the coil spring.
- Install the suspension strut. Refer to [page 87](#).

Tightening Specifications

Component	Tightening Specification
Suspension strut mount to shock absorber ◆ Use a new nut	60 Nm



6 Drive Axles, Removing and Installing

- ⇒ [B6.1 Bolt with Ribs, Loosening and Tightening, Drive Axle Threaded Connection", page 94](#)
- ⇒ [B6.2 Bolt without Ribs, Loosening and Tightening, Drive Axle Threaded Connection", page 96](#)
- ⇒ [A6.3 Axle with CV Joint, Removing and Installing", page 98](#)
- ⇒ [A6.4 Axles with Triple Roller Joint AAR3300i, Removing and Installing", page 101](#)



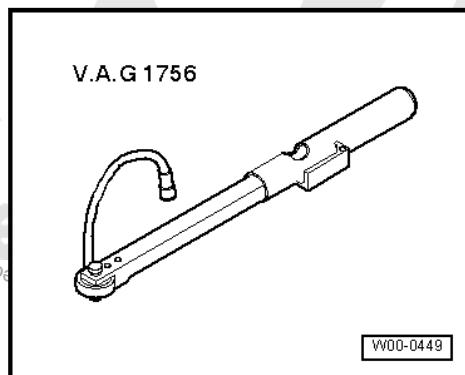
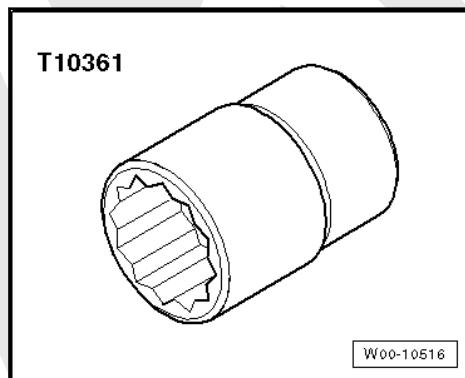
WARNING

When disassembling and performing repairs on a vehicle, the drive axles must not hang down loosely and contact the stops in the joint by over bending.

6.1 Twelve-Point Bolt with Ribs, Loosening and Tightening, Drive Axle Threaded Connection

Special tools and workshop equipment required

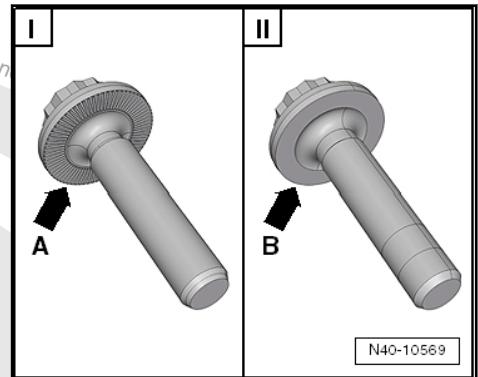
- ◆ Socket - 24mm -T10361-



- ◆ Digital Torque Wrench -V.A.G 1756A-



Difference between a twelve-point bolt with ribs and a twelve-point bolt without ribs



The contact surfaces -arrow A- and -arrow B- are different on the two-point bolts.

I - Twelve-Point Bolt with Ribs -arrow A-

II - Twelve-Point Bolt without Ribs -arrow B-



Caution

Do not load the wheel bearing if the wheel-side drive axle threaded connection is loose.

If the wheel bearings are under the load of the vehicle weight, the wheel bearing will be damaged. This reduces the service life of the wheel bearings.

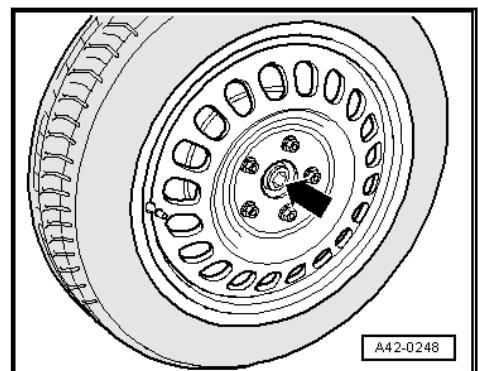
The drive axle bolt may be loosened maximum 90° when the vehicle is standing on its wheels.

Vehicles without a drive axle must not be moved, otherwise the wheel bearing will be damaged. If a vehicle must be moved, be sure to note the following:

- ◆ *Install an outer joint in place of the drive axle.*
- ◆ *Tighten the outer joint to 120 Nm.*

Twelve-Point Bolt, Loosening

- With vehicle still resting on its wheels, loosen the twelve-point bolt with the Socket - 24mm -T10361- a maximum 90°; otherwise, the wheel bearing will be damaged.
- Raise the vehicle until the wheels hang freely.
- Apply the brakes (second mechanic required).
- Remove the twelve-point bolt -arrow-.





Twelve-Point Bolt, Installing

- Replace the twelve-point bolt.



Note

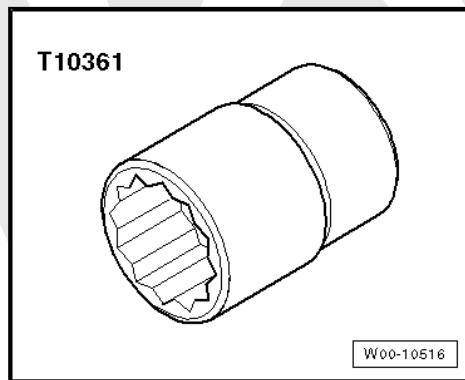
Wheels must not yet touch the ground when tightening the drive axle or the wheel bearing can be damaged.

- Apply the brakes (second mechanic required).
- Tighten the twelve-point bolt to 70 Nm.
- Set the vehicle on its wheels.
- Tighten the twelve-point bolt an additional 90°.

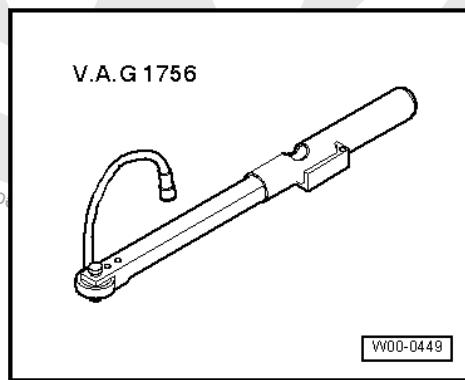
6.2 Twelve-Point Bolt without Ribs, Loosening and Tightening, Drive Axle Threaded Connection

Special tools and workshop equipment required

- ◆ Socket - 24mm -T10361-

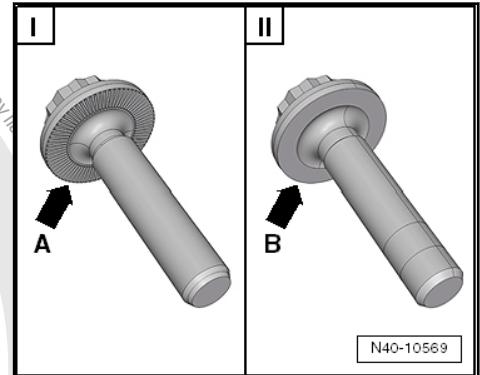


- ◆ Digital Torque Wrench -V.A.G 1756A-





Difference between a twelve-point bolt with ribs and a twelve-point bolt without ribs



The contact surfaces -arrow A- and -arrow B- are different on the two-point bolts.

I -Twelve-Point Bolt with Ribs -arrow A-

II -Twelve-Point Bolt without Ribs -arrow B-



Caution

Do not load the wheel bearing if the wheel-side drive axle threaded connection is loose.

If the wheel bearings are under the load of the vehicle weight, the wheel bearing will be damaged. This reduces the service life of the wheel bearings.

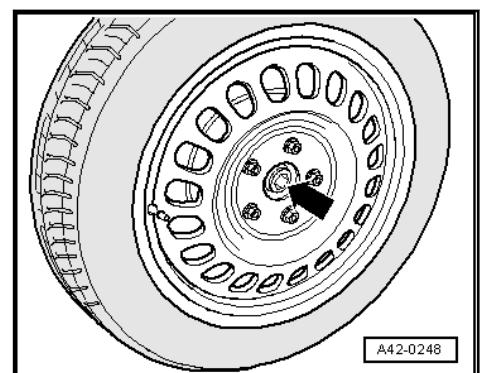
The drive axle bolt may be loosened maximum 90° when the vehicle is standing on its wheels.

Vehicles without a drive axle must not be moved, otherwise the wheel bearing will be damaged. If a vehicle must be moved, be sure to note the following:

- ◆ *Install an outer joint in place of the drive axle.*
- ◆ *Tighten the outer joint to 120 Nm.*

Twelve-Point Bolt, Loosening

- With vehicle still resting on its wheels, loosen the twelve-point bolt with the Socket - 24mm -T10361- a maximum 90°; otherwise, the wheel bearing will be damaged.
- Raise the vehicle until the wheels hang freely.
- Apply the brakes (second mechanic required).
- Remove the twelve-point bolt -arrow-.





Twelve-Point Bolt, Installing

- Replace the twelve-point bolt.



Wheels must not yet touch the ground when tightening the drive axle or the wheel bearing can be damaged.

- Apply the brakes (second mechanic required).
- Tighten the twelve-point bolt to 200 Nm.
- Set the vehicle on its wheels.
- Turn the twelve-point bolt an additional 180°.

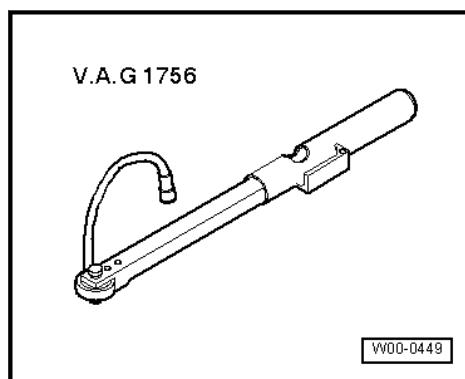
6.3 Drive Axle with CV Joint, Removing and Installing

Special tools and workshop equipment required

- ◆ Torque Wrench, 40-200Nm -V.A.G 1332A-



- ◆ Digital Torque Wrench -V.A.G 1756A-



Caution

When disassembling and performing repairs on a vehicle, the drive axles must not hang down loosely and contact the stops in the joint by over bending.

Removing

- Loosen the drive axle bolt on the wheel hub:
- ◆ Twelve-point bolt with ribs. Refer to [B6.1 bolt with Ribs, Loosening and Tightening, Drive Axle Threaded Connection](#), page 94 .



- ◆ Twelve-point bolt without ribs. Refer to [⇒ B6.2 olt without Ribs, Loosening and Tightening, Drive Axle Threaded Connection](#), page 96 .



Caution

Do not load the wheel bearing if the wheel-side drive axle threaded connection is loose.

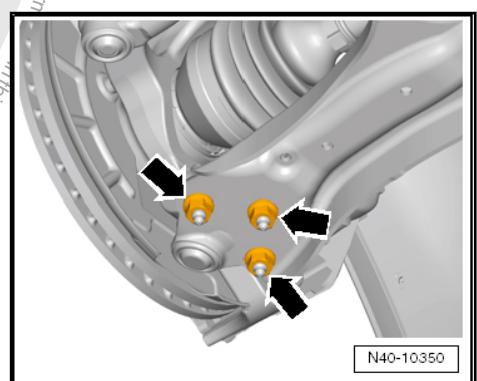
If the wheel bearings are under the load of the vehicle weight, the wheel bearing will be damaged. This reduces the service life of the wheel bearings.

The drive axle bolt may be loosened maximum 90° when the vehicle is standing on its wheels.

Vehicles without a drive axle must not be moved, otherwise the wheel bearing will be damaged. If a vehicle must be moved, be sure to note the following:

- ◆ *Install an outer joint in place of the drive axle.*
- ◆ *Tighten the outer joint to 120 Nm.*

- Remove the lower noise insulation. Refer to ⇒ Rep. Gr. 50; Overview - Noise Insulation.
- Remove the drive axle from the flange shaft/transmission.
- Remove the wheel.
- Slide outer joint out of wheel hub by hand.
- Remove the nuts -arrows-.



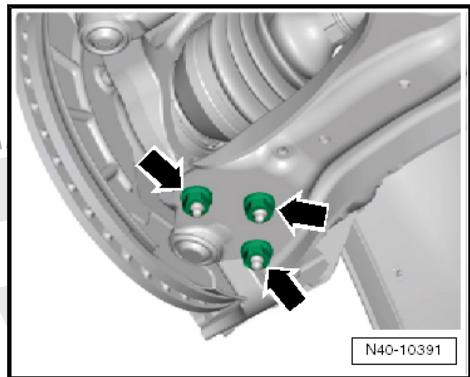
N40-10350

- Remove the wheel bearing housing with the ball joint from the control arm.
- Remove the drive axle from the wheel hub.

Installing

Remove any paint residue and/or corrosion in threads/splines of the outer joint.

- Insert the drive axle.
- Insert the outer joint as far as possible into the wheel hub splines.
- Attach the ball joint to the control arm -arrows-.



 Note

Make sure the ball joint boot is not damaged or twisted.

- Position the drive axle inner joint and tighten the bolts in a diagonal sequence to 10 Nm.
- Tighten the internal multi-point bolts diagonally to the tightening specification.
- Install the lower noise insulation. Refer to ⇒ Rep. Gr. 50; Overview - Noise Insulation.
- Tighten the drive axle bolt to the wheel hub:
 - ◆ Twelve-point bolt with ribs. Refer to ⇒ [B6.1 Bolt with Ribs, Loosening and Tightening, Drive Axle Threaded Connection](#), page 94 .
 - ◆ Twelve-point bolt without ribs. Refer to ⇒ [B6.2 Bolt without Ribs, Loosening and Tightening, Drive Axle Threaded Connection](#), page 96 .

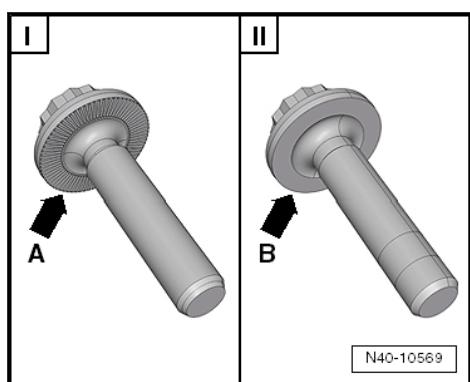


Caution

The vehicle must not be resting on the wheels when doing so.

When the bolt is loose, the wheel bearing can be damaged by the weight of the vehicle.

Difference between a twelve-point bolt with ribs and a twelve-point bolt without ribs



The contact surfaces -arrow A- and -arrow B- are different on the two-point bolts.



I - Twelve-Point Bolt with Ribs -arrow A-

II - Twelve-Point Bolt without Ribs -arrow B-

- Install the wheel and tighten. Refer to [⇒ M2 Counting Tightening Specifications](#), page 315 .

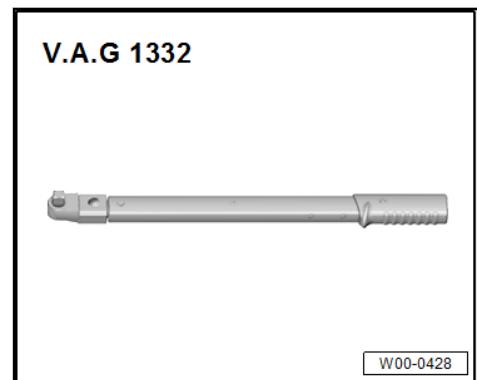
Tightening Specifications

Component	Tightening Specification
Control arm to cast-steel control arm ◆ Use new nuts	60 Nm
Control arm to steel panel or aluminum control arm ◆ Use new nuts	100 Nm
Drive axle to wheel hub "twelve-point bolt with ribs" ◆ Use a new bolt	70 Nm + 90°
Drive axle to wheel hub "twelve-point bolt without ribs" ◆ Use a new bolt	200 Nm + 180°
Drive axle to flange shaft/transmission "M8 internal multi-point bolt" ◆ Use new bolts. ◆ Use new backing plates	40 Nm ◆ Tighten to 10 Nm in a diagonal sequence
Drive axle to flange shaft/transmission "M10 internal multi-point bolt" ◆ Use new bolts. ◆ Use new backing plates	70 Nm ◆ Tighten to 10 Nm in a diagonal sequence

6.4 Drive Axles with Triple Roller Joint AAR3300i, Removing and Installing

Special tools and workshop equipment required

- ◆ Torque Wrench, 40-200Nm -V.A.G 1332A-



Caution

When disassembling and performing repairs on a vehicle, the drive axles must not hang down loosely and contact the stops in the joint by over bending.



Removing



Caution

When disassembling and performing repairs on a vehicle, the drive axles must not hang down loosely and contact the stops in the joint by over bending.

Removing

- Loosen the drive axle bolt on the wheel hub:
- ◆ Twelve-point bolt with ribs. Refer to [⇒ B6.1 olt with Ribs, Loosening and Tightening, Drive Axle Threaded Connection](#), page 94 .
- ◆ Twelve-point bolt without ribs. Refer to [⇒ B6.2 olt without Ribs, Loosening and Tightening, Drive Axle Threaded Connection](#), page 96 .



Caution

Do not load the wheel bearing if the wheel-side drive axle threaded connection is loose.

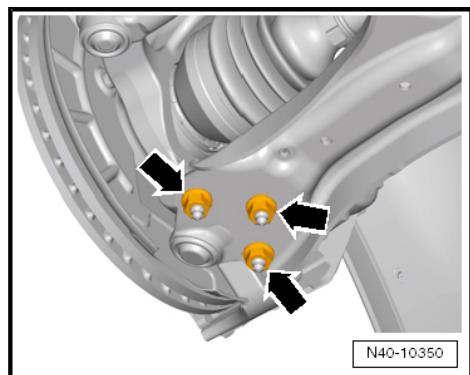
If the wheel bearings are under the load of the vehicle weight, the wheel bearing will be damaged. This reduces the service life of the wheel bearings.

The drive axle bolt may be loosened maximum 90° when the vehicle is standing on its wheels.

Vehicles without a drive axle must not be moved, otherwise the wheel bearing will be damaged. If a vehicle must be moved, be sure to note the following:

- ◆ *Install an outer joint in place of the drive axle.*
- ◆ *Tighten the outer joint to 120 Nm.*

- Remove the wheel.
- Remove the lower noise insulation. Refer to [⇒ Rep. Gr. 50; Overview - Noise Insulation](#).
- Remove the drive axle from the flange shaft/transmission.
- Remove the nuts -arrows-.



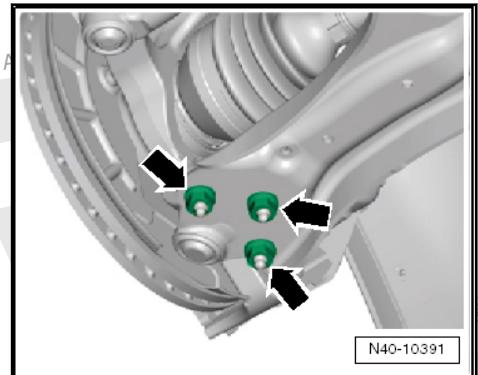
- Remove the wheel bearing housing with the ball joint from the control arm.
- Remove the drive axle from the wheel hub.



Installing

Remove any paint residue and/or corrosion in threads/splines of the outer joint.

- Insert the drive axle.
- Insert the outer joint as far as possible into the wheel hub splines.
- Attach the ball joint to the control arm -arrows-.



Note

Make sure the ball joint boot is not damaged or twisted.

- Position the drive axle inner joint and tighten the bolts in a diagonal sequence to 10 Nm.
- Tighten the internal multi-point bolts diagonally to the tightening specification.
- Install the lower noise insulation. Refer to => Rep. Gr. 50; Overview - Noise Insulation.
- Tighten the drive axle bolt to the wheel hub:
- ◆ Twelve-point bolt with ribs. Refer to => B6.1 olt with Ribs, Loosening and Tightening, Drive Axle Threaded Connection, page 94 .
- ◆ Twelve-point bolt without ribs. Refer to => B6.2 olt without Ribs, Loosening and Tightening, Drive Axle Threaded Connection, page 96 .



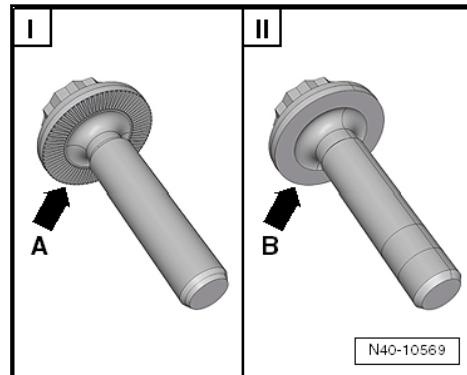
Caution

The vehicle must not be resting on the wheels when doing so.

When the bolt is loose, the wheel bearing can be damaged by the weight of the vehicle.



Difference between a twelve-point bolt with ribs and a twelve-point bolt without ribs



The contact surfaces -arrow A- and -arrow B- are different on the two-point bolts.

I - Twelve-Point Bolt with Ribs -arrow A-

II - Twelve-Point Bolt without Ribs -arrow B-

- Install the wheel and tighten. Refer to [M2 Counting Tightening Specifications](#), page 315 .

Tightening Specifications

Component	Tightening Specification
Control arm to cast-steel control arm ◆ Use new nuts	60 Nm
Control arm to steel panel or aluminum control arm ◆ Use new nuts	100 Nm
Drive axle to wheel hub "twelve-point bolt with ribs" ◆ Use a new bolt	70 Nm + 90°
Drive axle to wheel hub "twelve-point bolt without ribs" ◆ Use a new bolt	200 Nm + 180°
Drive axle to flange shaft/transmission "M8 internal multi-point bolt" ◆ Use new bolts.	40 Nm ◆ Tighten to 10 Nm in a diagonal sequence
Drive axle to flange shaft/transmission "M10 internal multi-point bolt" ◆ Use new bolts.	70 Nm ◆ Tighten to 10 Nm in a diagonal sequence



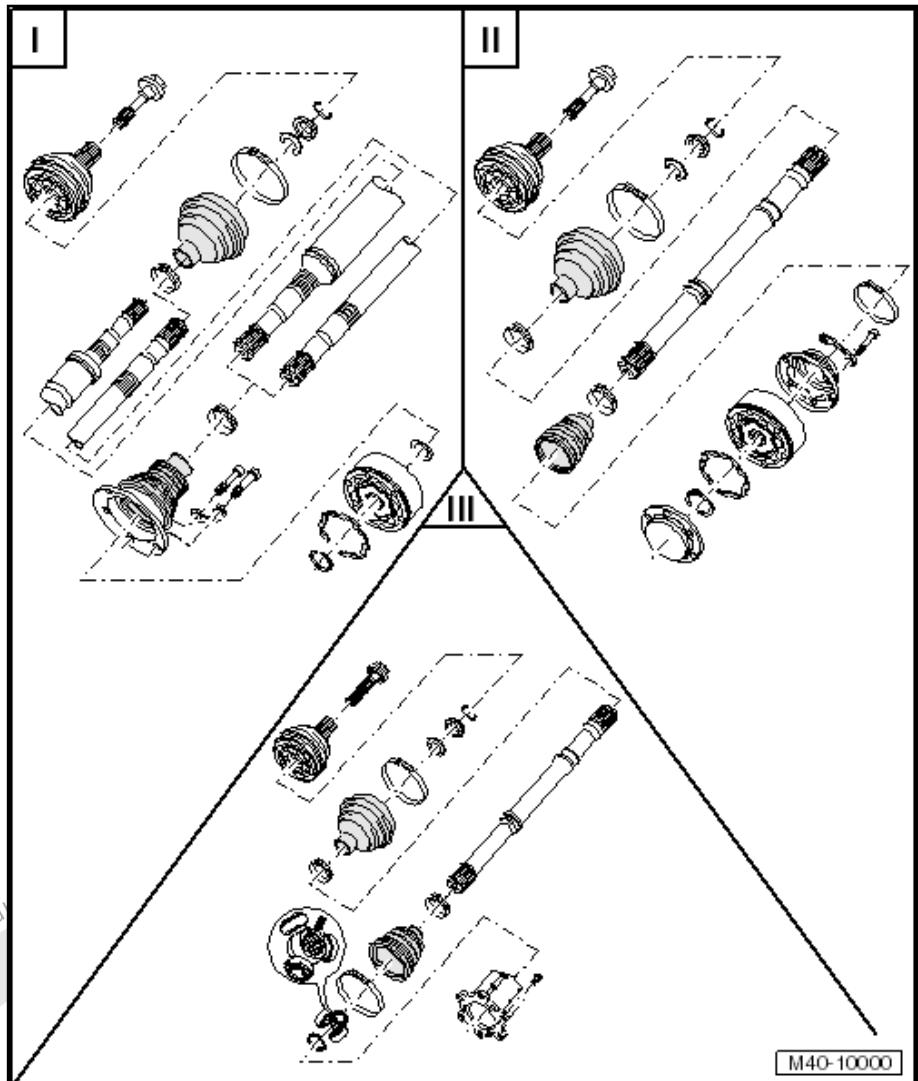
7 Drive Axles, Overview and Servicing

⇒ A7.1 xle Heat Shields", page 105

I - ⇒ -8 Drive Axle with CV Joint VL90 and VL100", page 107 .

II - ⇒ -9 Drive Axle with CV Joint VL 107", page 120 .

III - ⇒ -10 Drive Axle with Triple Roller Joint AAR3300i", page 129 .

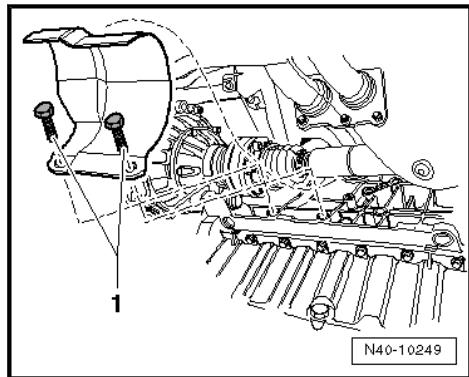


Drive Axles, Differentiating when Installed

	VL90	VL100	VL107	AAR3300i
Diameter of inner joint in mm	90	100	107	-
Cover between inner joint and flange shaft	-	-	X	-

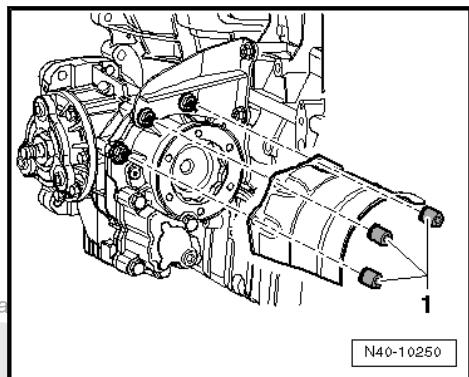
7.1 Drive Axle Heat Shields

FWD:



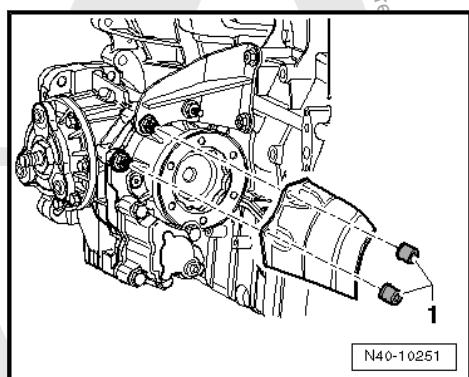
Component	Tightening Specification
Hex bolt -1-	25 Nm

AWD:



Component	Tightening Specification
Nuts -1-	20 Nm ◆ Tighten all nuts to 10 Nm

AWD:



Component	Tightening Specification
Nuts -1-	20 Nm ◆ Tighten all nuts to 10 Nm



8 Overview - Drive Axle with CV Joint VL90 and VL100

⇒ [A8.1 xle with CV Joint VL90 and VL100, Disassembling and Assembling", page 110](#)

⇒ [C8.2 V Joint, Checking", page 115](#)

⇒ [C8.3 V Joint, Checking", page 116](#)





1 - Outer CV Joint

- Only replace completely
- Removing. Refer to [page 112](#).
- Installing: using a plastic hammer, drive onto the shaft all the way
- Check using the Vehicle Diagnostic Tester. Refer to [C8.2 V Joint, Checking](#), page 115.

2 - Bolt

- Different versions
- Allocation. Refer to the [Electronic Parts Catalog \(ETKA\)](#).



WARNING

There are two types of twelve-point bolts, with and without ribs. Distinguishing characteristics. Refer to [Fig. "Difference between a twelve-point bolt with ribs and a twelve-point bolt without ribs"](#), page 110.

When installing a twelve-point bolt, always check what type of twelve-point bolt is to be used.

Use the correct tightening specification for the bolt.

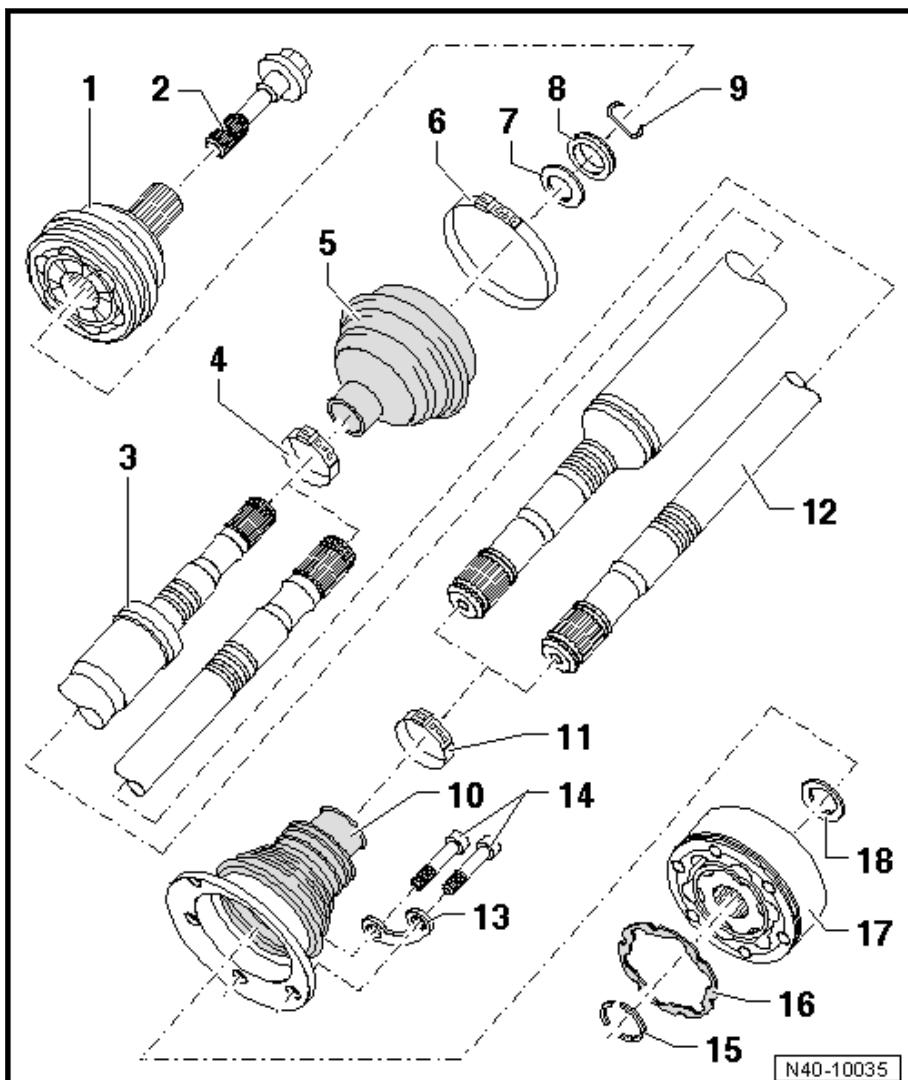
The tightening specification for a twelve-point bolt »with« ribs is 70 Nm + 90°. Refer to [B6.1 bolt with Ribs, Loosening and Tightening, Drive Axle Threaded Connection](#), page 94 for loosening and tightening.

The tightening specification for a twelve-point bolt »without« ribs is 200 Nm + 180°. Refer to [B6.2 bolt without Ribs, Loosening and Tightening, Drive Axle Threaded Connection](#), page 96 for loosening and tightening.

- Always replace if removed

3 - Right Drive Axle

4 - Clamp



N40-10035

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- Always replace if removed
- Tensioning. Refer to [Fig. “Tension the clamp on the small diameter”, page 115](#).

5 - CV Boot

- Check for tears and scuffing
- Material: Hytrel polyelastomer

6 - Clamp

- Always replace if removed
- Tensioning. Refer to [Fig. “Tightening clamp on the outer joint”, page 114](#).

7 - Plate Spring

- Installation position. Refer to [Fig. “Installed location of spring washer and thrust washer on outer joint”, page 113](#).

8 - Thrust Ring

- Installation position. Refer to [Fig. “Installed location of spring washer and thrust washer on outer joint”, page 113](#).

9 - Circlip

- Always replace if removed
- Insert in shaft groove

10 - CV Joint CV-Boot

- Material: Hytrel polyelastomer
- Without vent hole
- Check for tears and scuffing
- Drive off CV joint using a drift
- Coat the sealing surface with -D 454 300 A2- before installing it on the CV joint

11 - Clamp

- Always replace if removed
- Tensioning. Refer to [Fig. “Tightening clamp on the outer joint”, page 114](#).

12 - Left Drive Axle

13 - Backing Plate

14 - Internal Multi-Point Bolt

- First tighten diagonally to 10 Nm, then tighten diagonally again to the tightening specification
M8 bolt = 40 Nm
M10 bolt = 70 Nm
- After disassembly, always replace bolts

15 - Circlip

- Remove and install using the Valve Cotter Tool Kit -VW161A-

16 - Seal

- The adhesive surface on CV joint must not have any grease or oil on it.

17 - Inner CV Joint

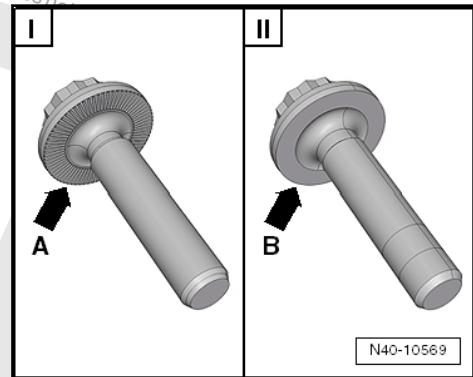
- Only replace completely
- Removing. Refer to [Fig. “Inner CV Joint, Removing”, page 113](#).
- Installing. Refer to [Fig. “Inner CV Joint, Pressing On”, page 114](#).
- Check using the Vehicle Diagnostic Tester Refer to [C8.3 V Joint, Checking”, page 116](#).

18 - Plate Spring

- Installation position. Refer to [page 113](#).



Difference between a twelve-point bolt with ribs and a twelve-point bolt without ribs



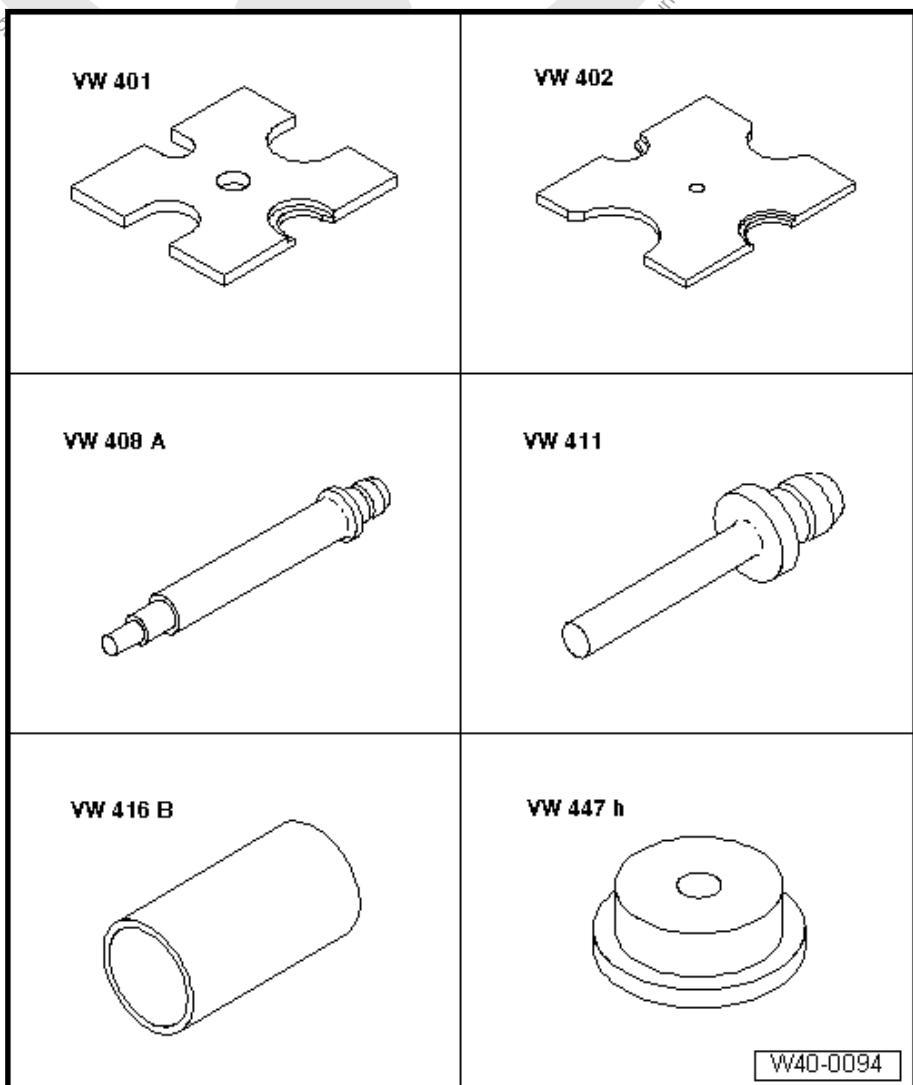
The contact surfaces -arrow A- and -arrow B- are different on the two-point bolts.

I - Twelve-Point Bolt with Ribs -arrow A-

II - Twelve-Point Bolt without Ribs -arrow B-

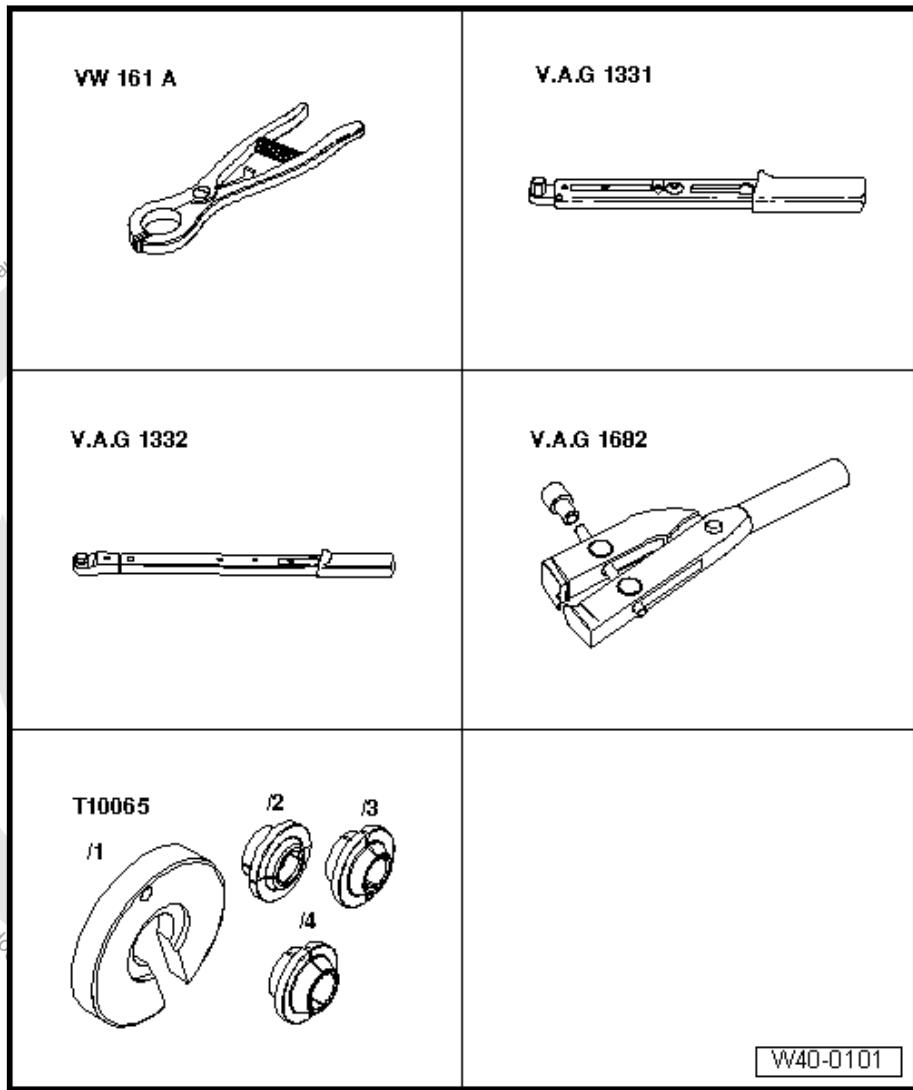
8.1 Drive Axle with CV Joint VL90 and VL100, Disassembling and Assembling

Special tools and workshop equipment required



- ◆ Press Plate -VW 401-
- ◆ Press Plate -VW 402-
- ◆ Press Piece - Rod -VW 408 A-
- ◆ Press Piece - Rod -VW 411-
- ◆ Press Piece - 37mm -VW 416 B-
- ◆ Press Piece - Multiple Use -VW 447 H-

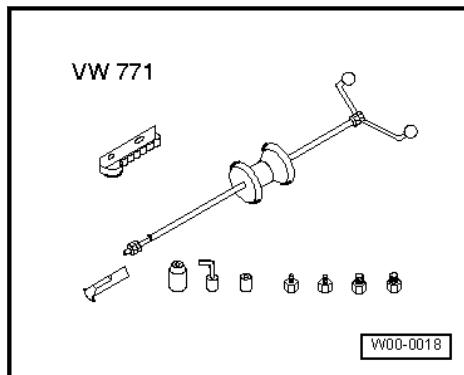
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prior written permission is granted.


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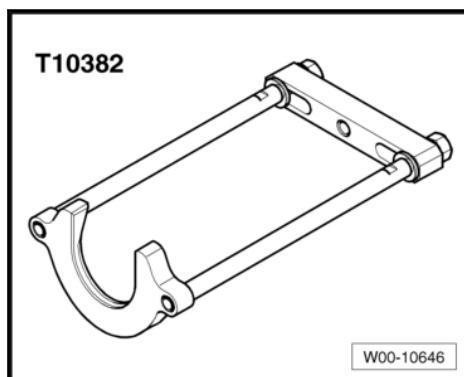
- ◆ Circlip Pliers -VW 161 A-
- ◆ Torque Wrench, 6-50Nm -VAG 1331A-
- ◆ Torque Wrench, 40-200Nm -V.A.G 1332A-
- ◆ Clamping Pliers -V.A.G 1682A-
- ◆ Tripod Joint Tool -T10065-



◆ Slide Hammer Set -VW 771-

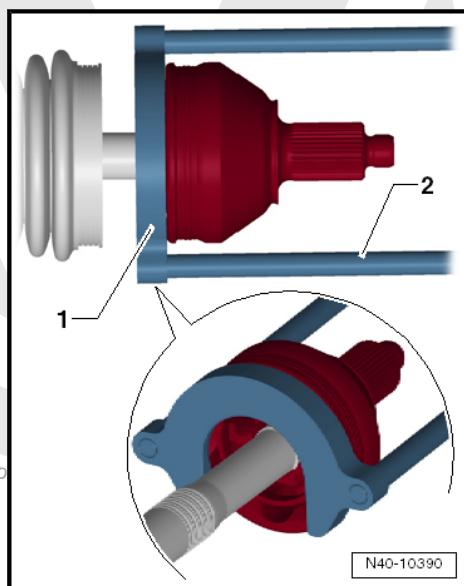


◆ Puller - Drive Axle -T10382-



Outer CV Joint, Removing

- Clamp the drive axle in a vise with jaw protectors.
- Fold back the boot.
- Align the Puller - Driveshaft -T10382- so that the flat side of the Puller - Driveshaft - Removing Plate -T10382/1- faces the Puller - Driveshaft - Spindles -T10382/2-.
- Attach the Puller - Drive Axle -T10382- to the Slide Hammer Set -VW 771-.
- Remove the CV joint from the drive axle using the Puller - Driveshaft -T10382- and Slide Hammer Set -VW 771-.



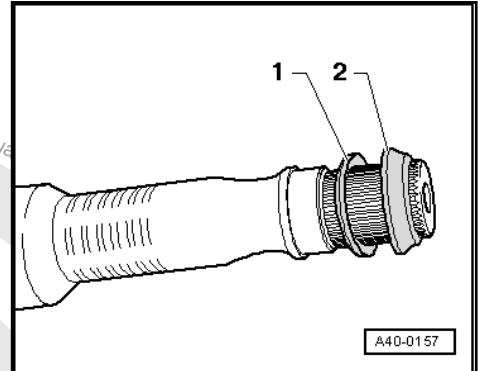
1 - Puller - Drive Axle - Removing Plate -T10382/1-



2 - Puller - Drive Axle - Spindles -T10382/2-

Outer CV Joint, Installing

Installed location of spring washer and thrust washer on outer joint



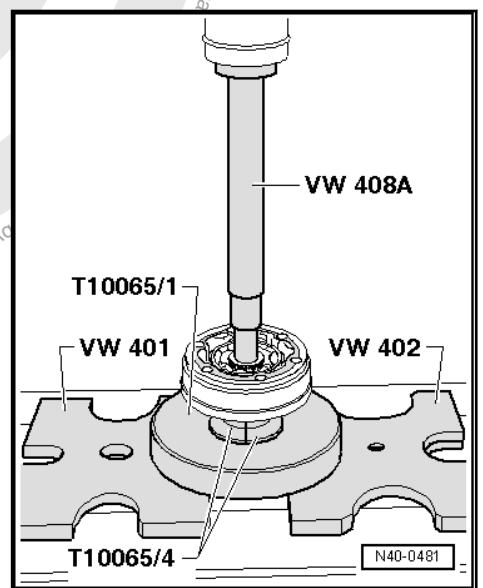
A40-0157

1 - Plate Spring

2 - Thrust Ring

- Install the new circlips.
- Slide the new CV boot onto the drive axle if necessary.
- Use a plastic mallet to install it on the shaft until the circlip engages.

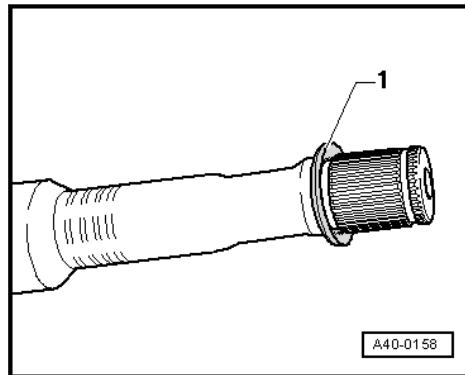
Inner CV Joint, Removing



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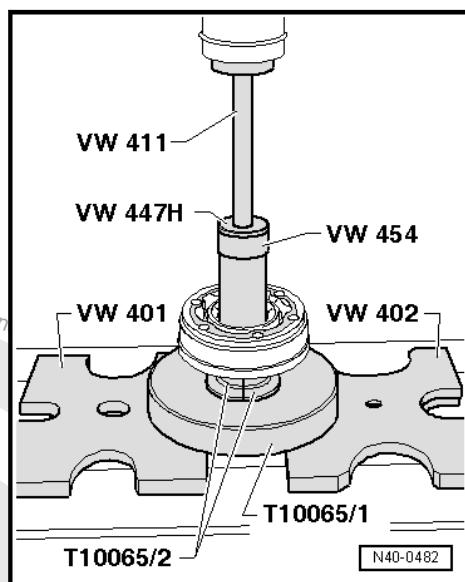
Assembling

Installation position of the plate spring on inner joint



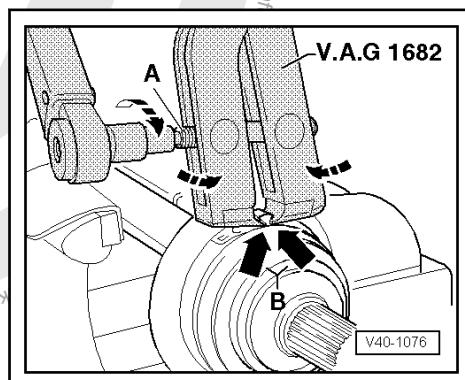
1 - Plate Spring

Inner CV Joint, Pressing On



Chamfer on inner diameter of ball hub (splines) must face the contact shoulder on the drive axle.

Tightening clamp on the outer joint



- Attach the Clamping Pliers -V.A.G 1682A- as shown. When doing this, make sure that edges of the pliers are positioned in the corners -B arrows- of the clamp.

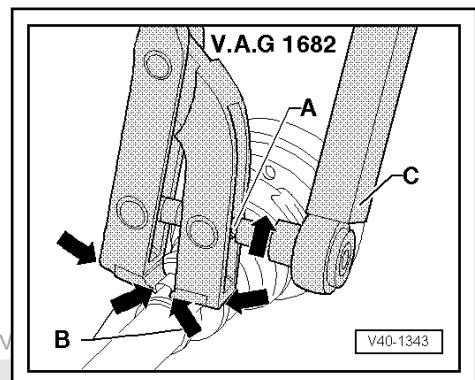


- Tension the clamp by turning spindle with a torque wrench (without tilting the pliers).

Note

- ◆ *The hard material of the CV boot (compared to rubber) makes it necessary to use a stainless steel hose clamp. It is only possible to tighten the clamp using Clamping Pliers -V.A.G 1682A-.*
- ◆ *Tightening specification: 25 Nm.*
- ◆ *Use torque wrench -C- with adjustment range 5 to 50 Nm (for example Torque Wrench 1331 5-50Nm -V.A.G 1331-).*
- ◆ *Make sure the spindle threads -A- on the pliers move easily. Lubricate with MOS 2 grease, if necessary.*
- ◆ *If it does not move freely, for example due to dirt in thread, the required clamp tension will not be achieved at the specified torque.*

Tension the clamp on the small diameter

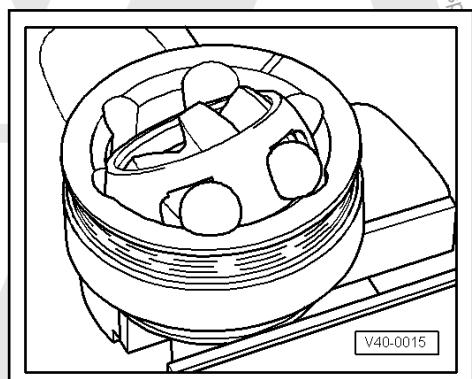


8.2 Outer CV Joint, Checking

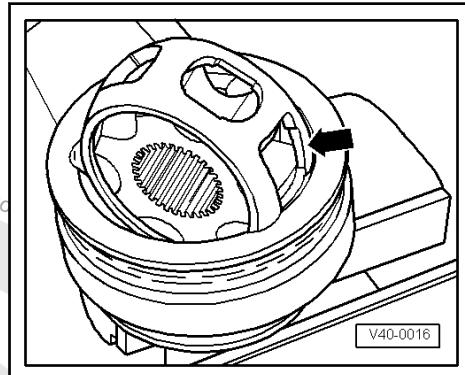
It is necessary to disassemble the joint whenever replacing the grease or if the ball surfaces show wear or damage.

Removing

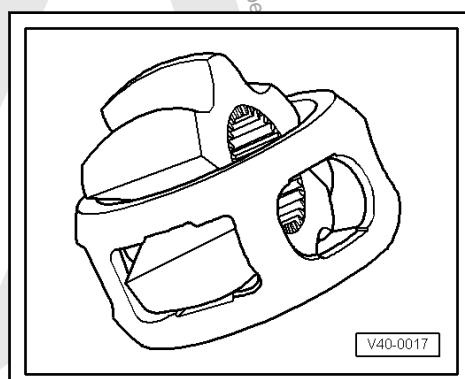
- Mark the position of ball hub to ball cage and to housing before disassembling, using an electric engraver or grindstone.



- Tilt the ball hub and ball cage.
- Remove the balls one after the other.
- Turn the cage, until two rectangular windows -arrow- rest on the joint housing.



- Lift out cage with hub.
- Swing segment of hub into rectangular window of cage.



- Fold hub out from cage.

The six balls for each joint belong to a tolerance group. Check the axle stub, hub, cage and balls for small depressions (pitting build-up) and chafing. Excessive circumferential backlash in joint makes itself noticed via tip-in shock, in such cases joint should be replaced. Flattening and running marks on the balls are no reason to replace a joint.

Installing

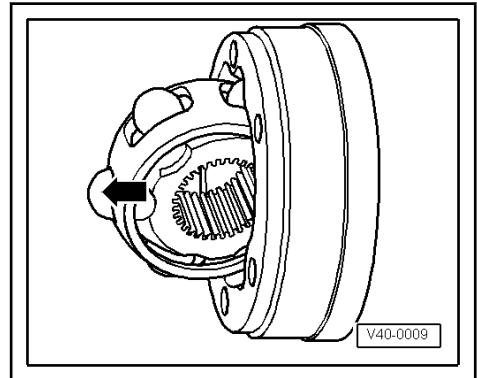
- Press in half of the total grease amount (40 grams) into joint body.
- Insert cage with hub into joint body.
- Press in the opposite facing balls one after the other, and the old ball hub position to the ball cage and to the joint housing must be replicated.
- Install the new circlip into the hub.
- Distribute the remaining grease in the joint boot.

8.3 Inner CV Joint, Checking

Removing

It is necessary to disassemble the joint whenever replacing the grease or if the ball surfaces show wear or damage.

- Tilt the ball hub and ball cage.



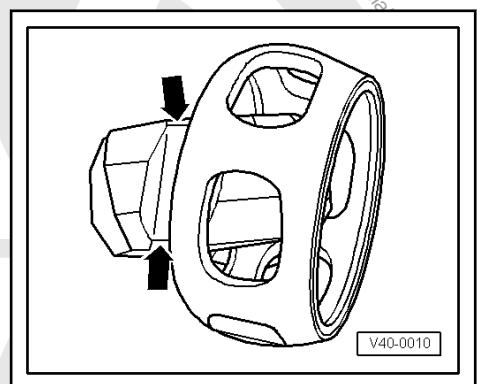
- Remove the joint in the direction of the arrow.
- Remove the balls from the cage.



Note

Ball hub and joint piece are paired. Do not interchange.

- Flip out ball hub from ball cage via the ball race -arrows-

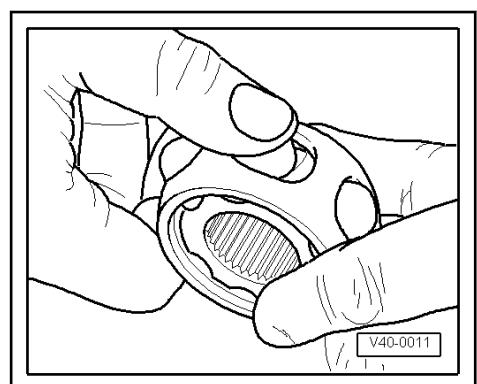


- Check the joint, ball hub, ball cage and balls for small broken off depressions (pitting) and chafing.

Excessive circumferential backlash in joint makes itself noticed via tip-in shock. Joint must be replaced in such cases. Flattening and running marks on the balls are no reason to replace the joint.

Installing

- Insert the ball hub into the ball cage via two chamfers. The installation position is arbitrary. Press balls into cage.

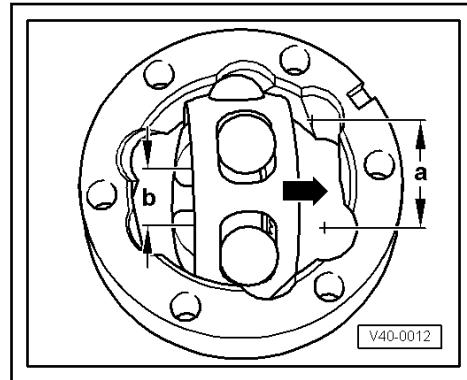




Ball hub has two different distances between ball tracks, a larger and a smaller.

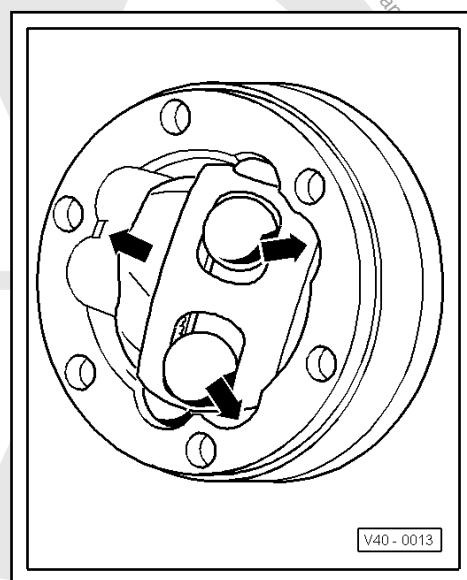
- Insert hub with cage and balls upright into joint piece.

When inserting, make sure that in each case the wide gap -a- at joint piece contacts narrow gap -b- at hub after swinging in.

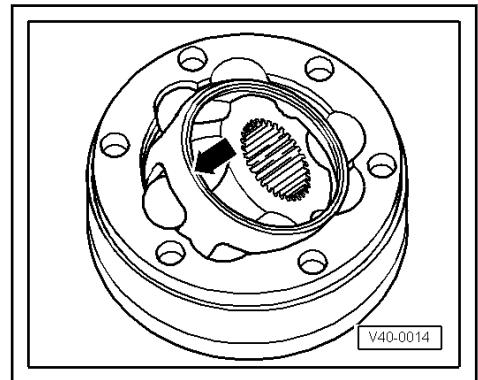


Chamfer on inner diameter of ball hub (splines) must face the large diameter of the joint.

- Also note chamfer on inner diameter of ball hub, it must be visible after swiveling in.
- Swing in the ball hub, to do so swing out the hub far enough from the cage -arrows- so that the balls have the distance of the running paths.



- Swing in hub with balls by pressing forcefully onto cage -arrow-.



CV joint, checking for function

The CV joint is properly assembled, if the ball hub can be slid back and forth by hand over the entire length adjustment.





9 Overview - Drive Axle with CV Joint VL 107

⇒ **A9.1 xle with CV Joint VL107, Disassembling and Assembling", page 123**



1 - Outer CV Joint

- Only replace completely
- Removing. Refer to [Fig. "Outer CV Joint, Removal", page 125](#).
- Installing: using a plastic hammer, drive onto the shaft all the way
- Check using the Vehicle Diagnostic Tester. Refer to [C8.2 V Joint, Checking](#), page 115.

2 - Bolt

- Different versions
- Allocation. Refer to the [Electronic Parts Catalog \(ETKA\)](#).

WARNING
There are two types of twelve-point bolts, with and without ribs. Distinguishing characteristics. Refer to [Fig. "Difference between a twelve-point bolt with ribs and a twelve-point bolt without ribs", page 123](#).

When installing a twelve-point bolt, always check what type of twelve-point bolt is to be used.

Use the correct tightening specification for the bolt.

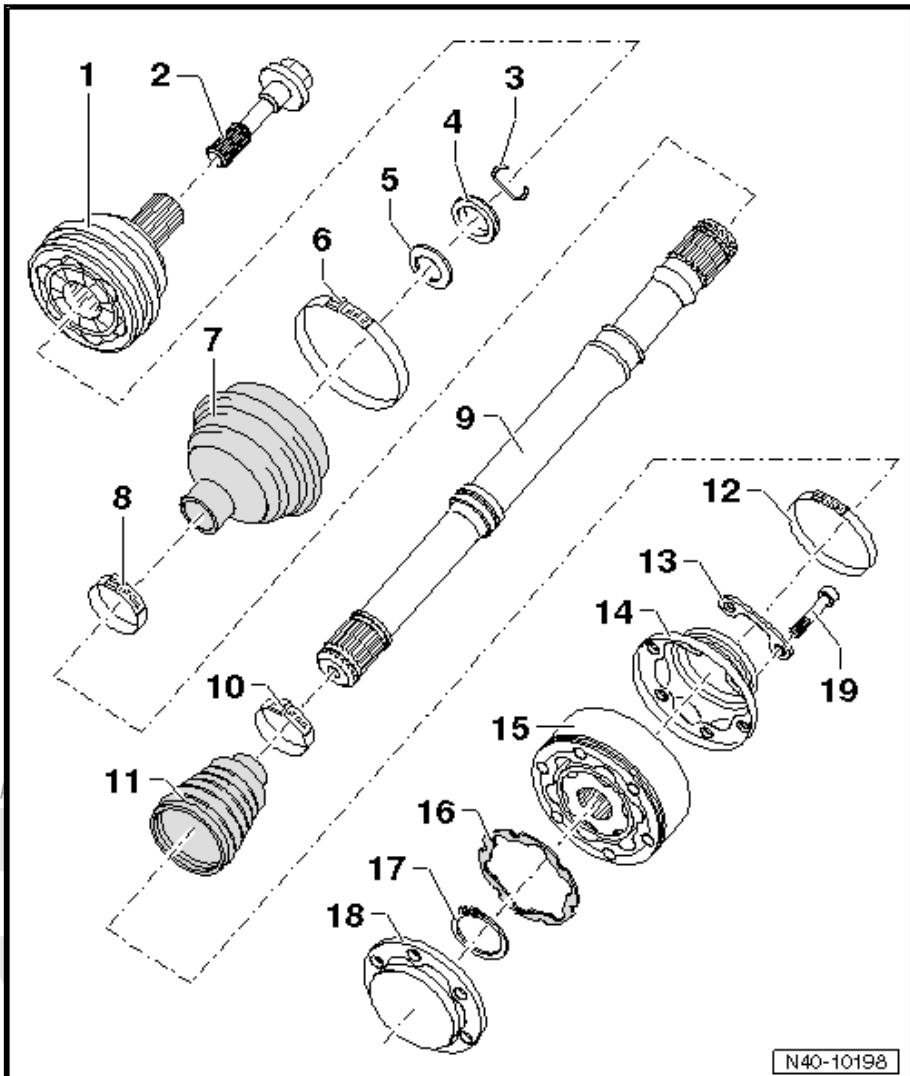
The tightening specification for a twelve-point bolt »with« ribs is 70 Nm + 90°. Refer to [B6.1 olt with Ribs, Loosening and Tightening, Drive Axle Threaded Connection](#), page 94 for loosening and tightening.

The tightening specification for a twelve-point bolt »without« ribs is 200 Nm + 180°. Refer to [B6.2 olt without Ribs, Loosening and Tightening, Drive Axle Threaded Connection](#), page 96 for loosening and tightening.

- Always replace if removed

3 - Circlip

- Always replace if removed





- Insert in shaft groove

4 - Thrust Ring

- Installation position. Refer to [Fig. "Installed location of spring washer and thrust washer on outer joint", page 125](#).

5 - Plate Spring

- Installation position. Refer to [Fig. "Installed location of spring washer and thrust washer on outer joint", page 125](#).

6 - Clamp

- Always replace if removed
- Tensioning. Refer to [Fig. "Tightening clamp on the outer joint", page 127](#).

7 - CV Boot

- Check for tears and scuffing
- Material: Hytrel polyelastomer

8 - Clamp

- Always replace if removed
- Tensioning. Refer to [Fig. "Tension the clamp on the small diameter", page 128](#).

9 - Drive Axle

10 - Clamp

- Always replace if removed
- Tensioning. Refer to [Fig. "Tension the clamp on the small diameter", page 128](#).

11 - CV Joint CV Boot

- Material: Hytrel polyelastomer
- Without vent hole
- Check for tears and scuffing
- Drive off CV joint using a drift
- Coat the sealing surface with -D 454 300 A2- before installing it on the CV joint

12 - Clamp

- Always replace if removed

13 - Backing Plate

14 - Cap

- Carefully drive off using a drift
- Coat the sealing surface with -D 454 300 A2- before installing it on the CV joint
- Adhesive surface must be free of oil and grease

15 - Inner CV Joint

- Only replace completely
- Removing. Refer to [Fig. "Inner CV Joint, Removing", page 126](#).
- Installing. Refer to [Fig. "Inner CV Joint, Pressing On", page 126](#).
- Check using the Vehicle Diagnostic Tester Refer to [C8.3 V Joint, Checking](#), page 116.

16 - Seal

- The adhesive surface on CV joint must not have any grease or oil on it.

17 - Circlip

- Remove and install using the Valve Cotter Tool Kit -VW 161A-

18 - Cover

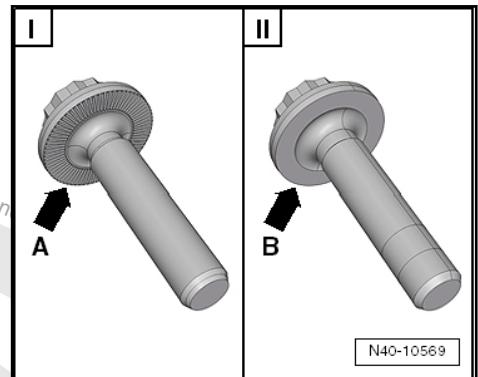
- Always replace if removed
- Always replace
- Removing. Refer to [Fig. "Drive off cover for inner joint", page 126](#).

19 - Internal Multi-Point Bolt



- First tighten diagonally to 10 Nm, then tighten diagonally again to the tightening specification
- 70 Nm
- After disassembly, always replace bolts

Difference between a twelve-point bolt with ribs and a twelve-point bolt without ribs



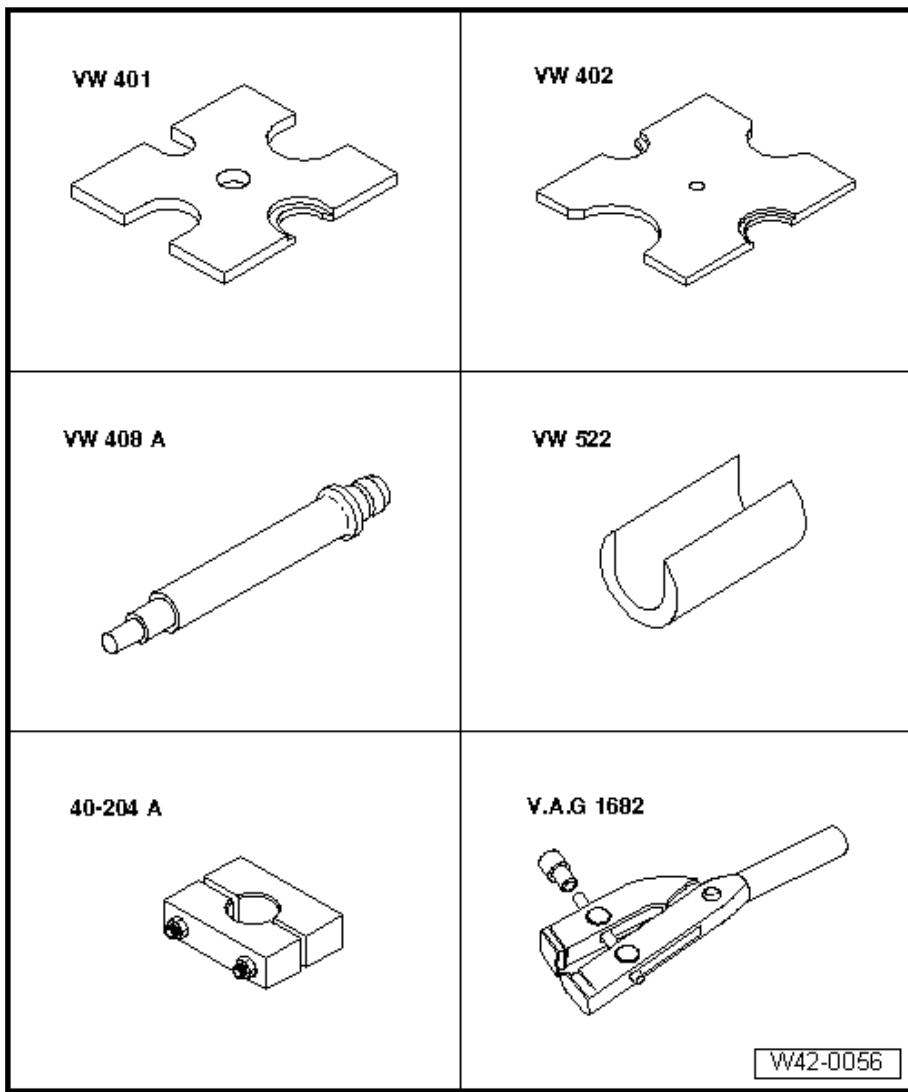
The contact surfaces -arrow A- and -arrow B- are different on the two-point bolts.

- I - Twelve-Point Bolt with Ribs -arrow A-
- II - Twelve-Point Bolt without Ribs -arrow B-

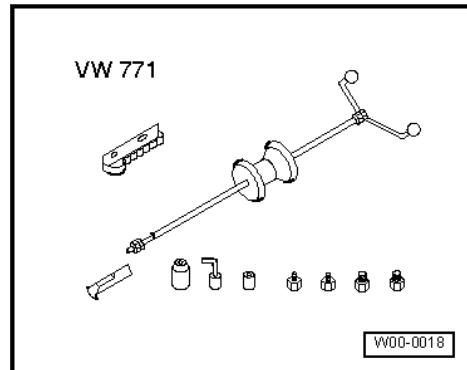
9.1 Drive Axle with CV Joint VL107, Disassembling and Assembling



Special tools and workshop equipment required

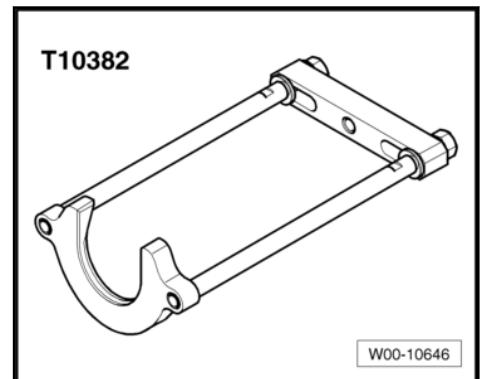


- ◆ Press Plate -VW 401-
- ◆ Press Plate -VW 402-
- ◆ Press Piece - Rod -VW 408 A-
- ◆ CV Joint Press Sleeve -VW 522-
- ◆ Press Block -40 - 204 A-
- ◆ Clamping Pliers -V.A.G 1682A-
- ◆ Slide Hammer Set -VW 771-



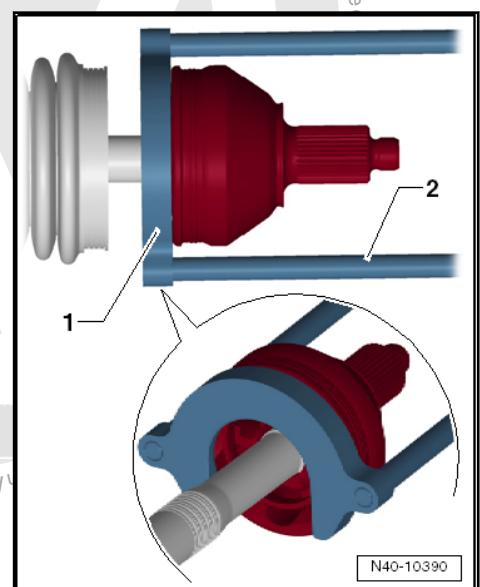


◆ Puller - Drive Axle -T10382-



Outer CV Joint, Removing

- Clamp the drive axle in a vise with jaw protectors.
- Fold back the boot.
- Align the Puller - Driveshaft -T10382- so that the flat side of the Puller - Driveshaft -Removing Plate -T10382/1- faces the Puller - Driveshaft - Spindles -T10382/2-.
- Attach the Puller - Drive Axle -T10382- to the Slide Hammer Set -VW 771-.
- Remove the CV joint from the drive axle using the Puller - Driveshaft -T10382- and Slide Hammer Set -VW 771-.

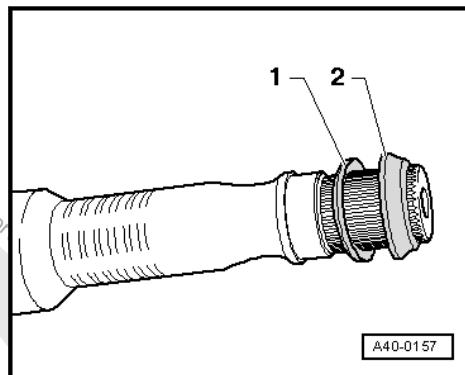


1 - Puller - Drive Axle - Removing Plate -T10382/1-

2 - Puller - Drive Axle - Spindles -T10382/2-

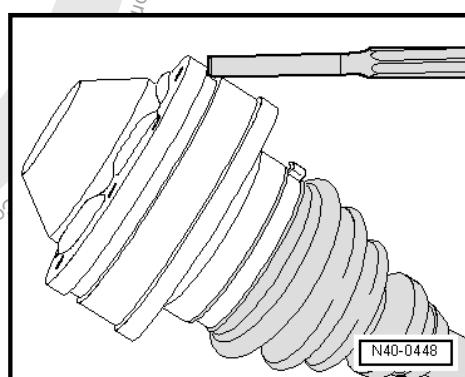
Outer CV Joint, Installing

Installed location of spring washer and thrust washer on outer joint



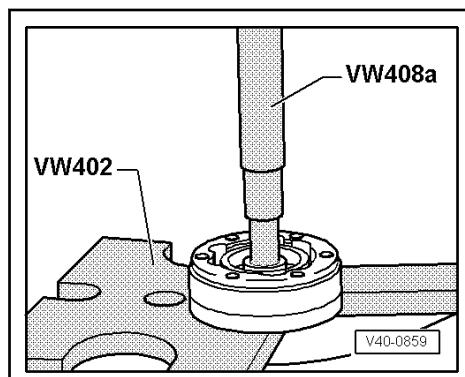
1 - Plate Spring
2 - Thrust Ring
– Install the new circlips.
– Slide the new CV boot onto the drive axle if necessary.
– Use a plastic mallet to install it on the shaft until the circlip engages.

Drive off cover for inner joint



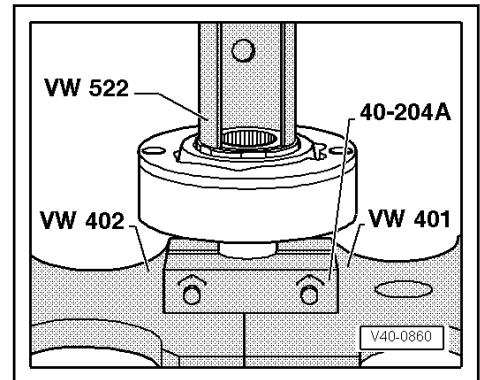
- Remove the circlip.
- Remove both clamps and slide the CV boot toward the outer joint.
- Drive out CV joint boot with a drift.

Inner CV Joint, Removing

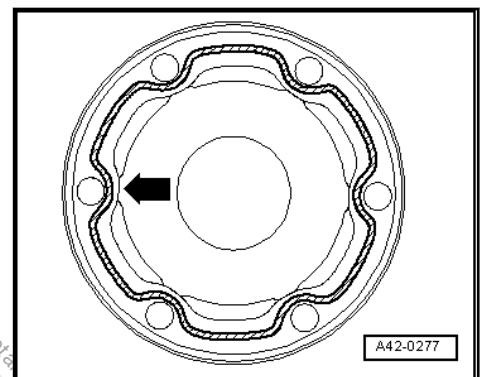


Assembling

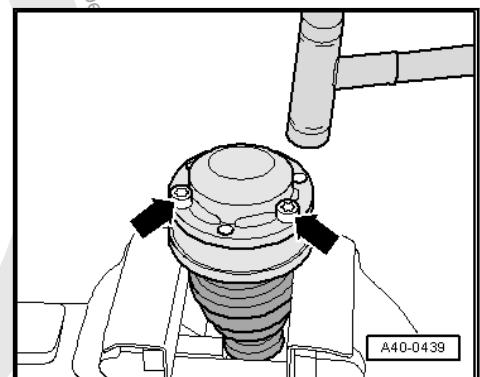
Inner CV Joint, Pressing On



- Press on joint until it stops.
- Install the circlip.
- Coat the cover sealing surface with -D 454 300 A2-.



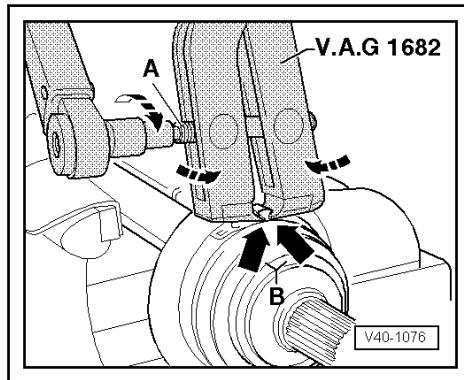
- Apply a continuous sealant bead with 2 to 3 mm diameter in area of inner holes -arrow- to the clean cover surface.
- Align the new cover with screws -arrows- to screw holes.



It must be aligned exactly because it cannot be aligned after installing.

- Drive cover on with a plastic mallet.
- Wipe away any sealant leaking out.

Tightening clamp on the outer joint

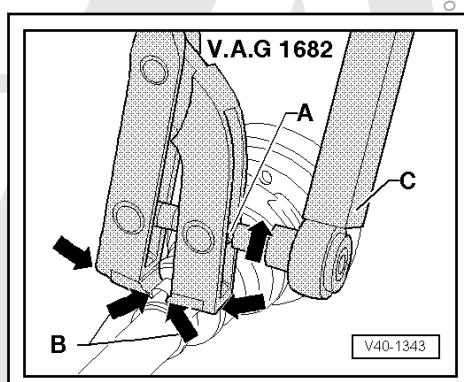


- Attach Clamping Pliers -V.A.G 1682- as shown in illustration. Be sure that edges of the pliers are in the corners -B arrows- of the hose clamp.
- Tension the clamp by turning spindle with a torque wrench (without tilting the pliers).

Note

- ◆ The hard material of the CV boot (compared to rubber) makes it necessary to use a stainless steel hose clamp. It is only possible to tighten the clamp using Clamping Pliers -V.A.G 1682A-.
- ◆ Tightening specification: 25 Nm.
- ◆ Use torque wrench -C- with adjustment range 5 to 50 Nm (for example Torque Wrench 1331 5-50Nm -V.A.G 1331-).
- ◆ Make sure the spindle threads -A- on the pliers move easily. Lubricate with MOS 2 grease, if necessary.
- ◆ If it does not move freely, for example due to dirt in thread, the required clamp tension will not be achieved at the specified torque.

Tension the clamp on the small diameter



Outer CV joint, checking. Refer to [⇒ C8.2 V Joint, Checking](#), page 115 .

Inner CV joint, checking. Refer to [⇒ C8.3 V Joint, Checking](#), page 116 .

CV joint, checking function. Refer to [page 119](#) .



10 Overview - Drive Axle with Triple Roller Joint AAR3300i

⇒ **A10.1 xle with Triple Roller Joint AAR3300i, Disassembling and Assembling", page 132**





1 - Outer CV Joint

- Only replace completely
- Removing. Refer to [page 134](#).
- Installing: drive onto the shaft with a plastic mallet until the compressed circlip rebounds.
- Check using the Vehicle Diagnostic Tester. Refer to [C8.2 V Joint, Checking](#), page 115.

2 - Bolt

- Different versions
- Allocation. Refer to the [Electronic Parts Catalog \(ETKA\)](#).



WARNING

There are two types of twelve-point bolts, with and without ribs. Distinguishing characteristics. Refer to [Fig. "Difference between a twelve-point bolt with ribs and a twelve-point bolt without ribs"](#), page 131.

When installing a twelve-point bolt, always check what type of twelve-point bolt is to be used.

Use the correct tightening specification for the bolt.

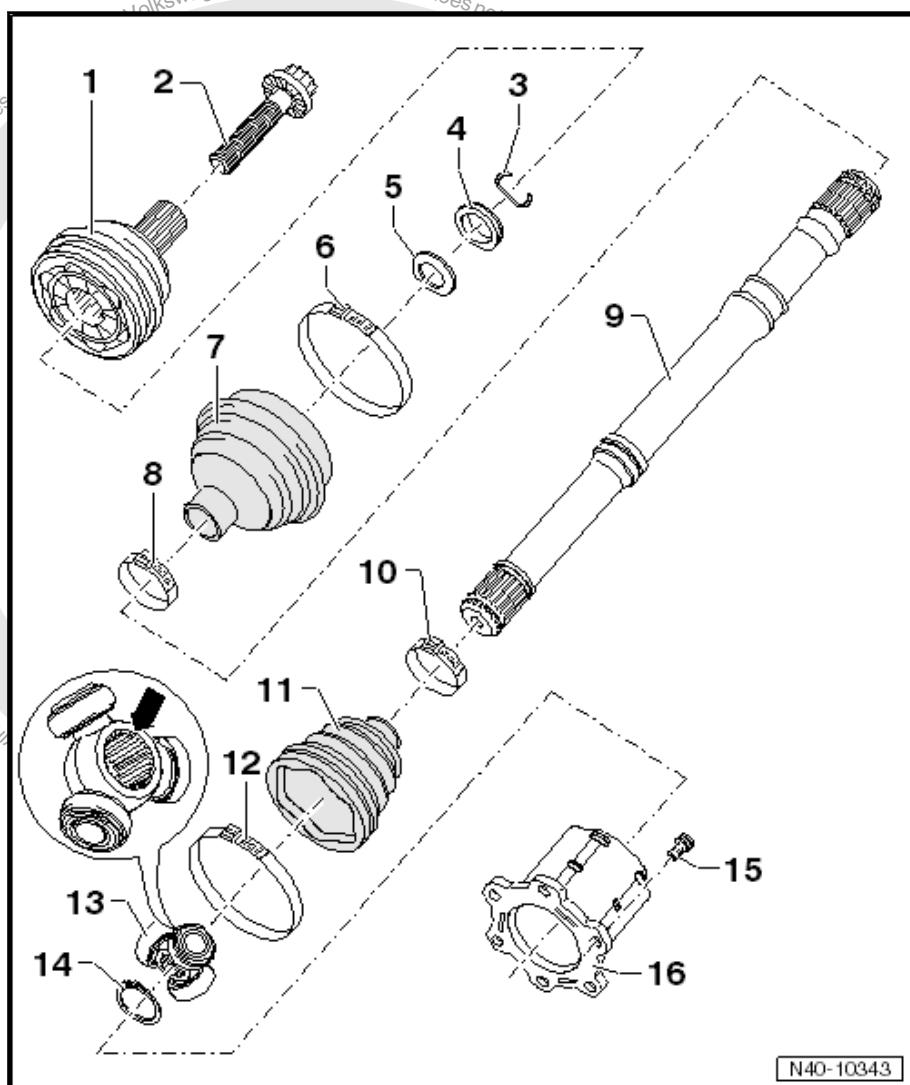
The tightening specification for a twelve-point bolt »with« ribs is 70 Nm + 90°. Refer to [B6.1 olt with Ribs, Loosening and Tightening, Drive Axle Threaded Connection](#), page 94 for loosening and tightening.

The tightening specification for a twelve-point bolt »without« ribs is 200 Nm + 180°. Refer to [B6.2 olt without Ribs, Loosening and Tightening, Drive Axle Threaded Connection](#), page 96 for loosening and tightening.

- Always replace if removed

3 - Circlip

- Always replace if removed



N40-10343



- Insert in shaft groove

4 - Thrust Ring

- Installation position. Refer to [Fig. "Installed location of spring washer and thrust washer on outer joint"](#), page 135 .

5 - Plate Spring

- Installation position. Refer to [Fig. "Installed location of spring washer and thrust washer on outer joint"](#), page 135 .

6 - Clamp

- Always replace if removed
- Tensioning. Refer to [Fig. "Tightening clamp on the outer joint"](#), page 138 .

7 - CV Joint CV Boot

- Check for tears and scuffing
- Material: Hytrel polyelastomer

8 - Clamp

- Always replace if removed
- Tensioning. Refer to [Fig. "Tightening the tensioning clamp on the smaller diameter on the inner/outer joint"](#), page 139 .

9 - Drive Axle

10 - Clamp

- Always replace if removed
- Tensioning. Refer to [Fig. "Tightening the tensioning clamp on the smaller diameter on the inner/outer joint"](#), page 139 .

11 - CV Boot for Triple Roller Joint

- Check for tears and scuffing

12 - Clamp

- Always replace if removed
- Tensioning. Refer to [Fig. "Tightening the tensioning clamps on the larger diameter on the inner joint"](#), page 138 .

13 - Triple Roller Star with Rollers

The chamfer -arrow- faces the drive axle splines.

14 - Circlip

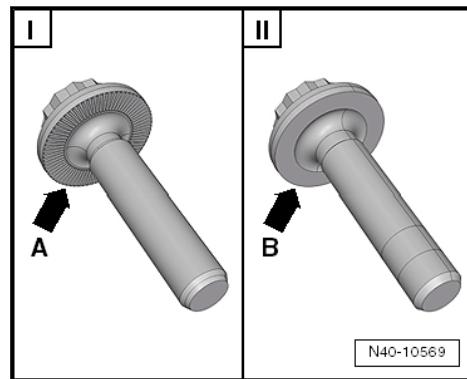
- Always replace if removed
- Insert in shaft groove

15 - Internal Multi-Point Bolt

- First tighten diagonally to 10 Nm, then tighten diagonally again to the tightening specification
- 70 Nm

16 - Joint

Difference between a twelve-point bolt with ribs and a twelve-point bolt without ribs



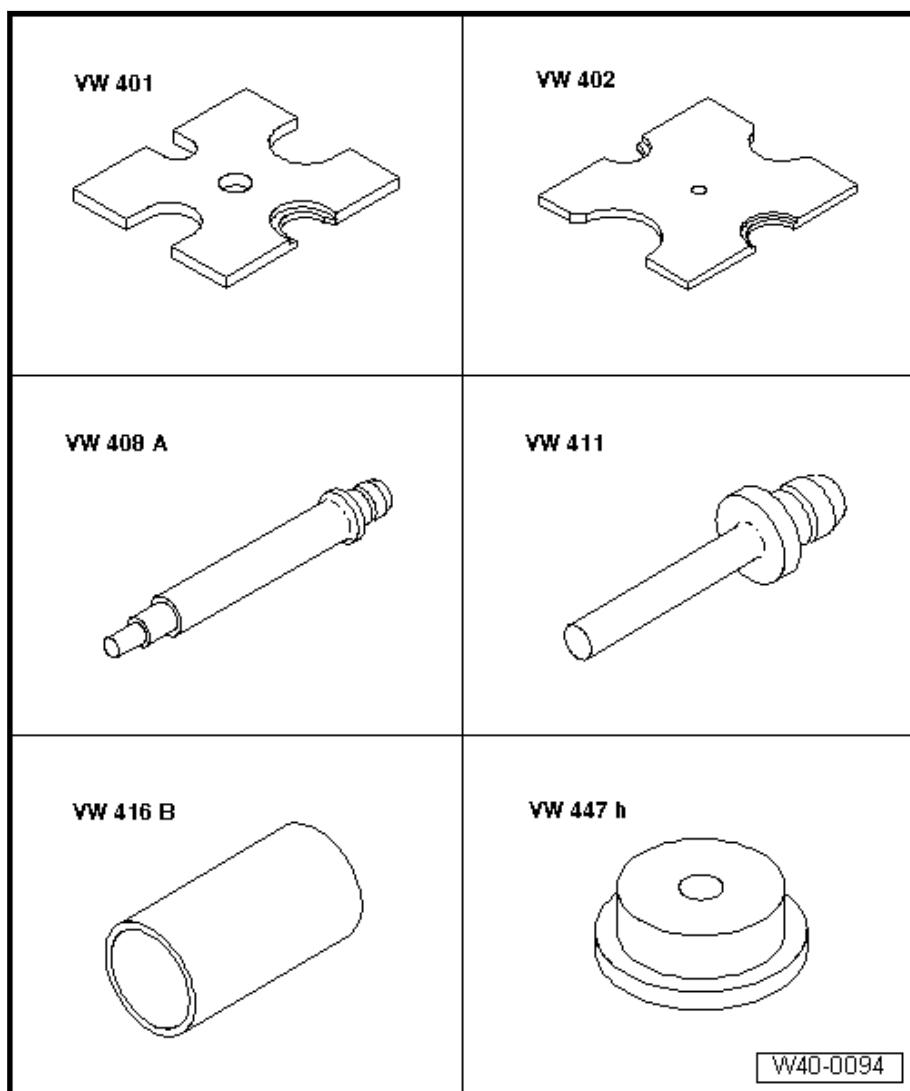
The contact surfaces -arrow A- and -arrow B- are different on the two-point bolts.

I - Twelve-Point Bolt with Ribs -arrow A-

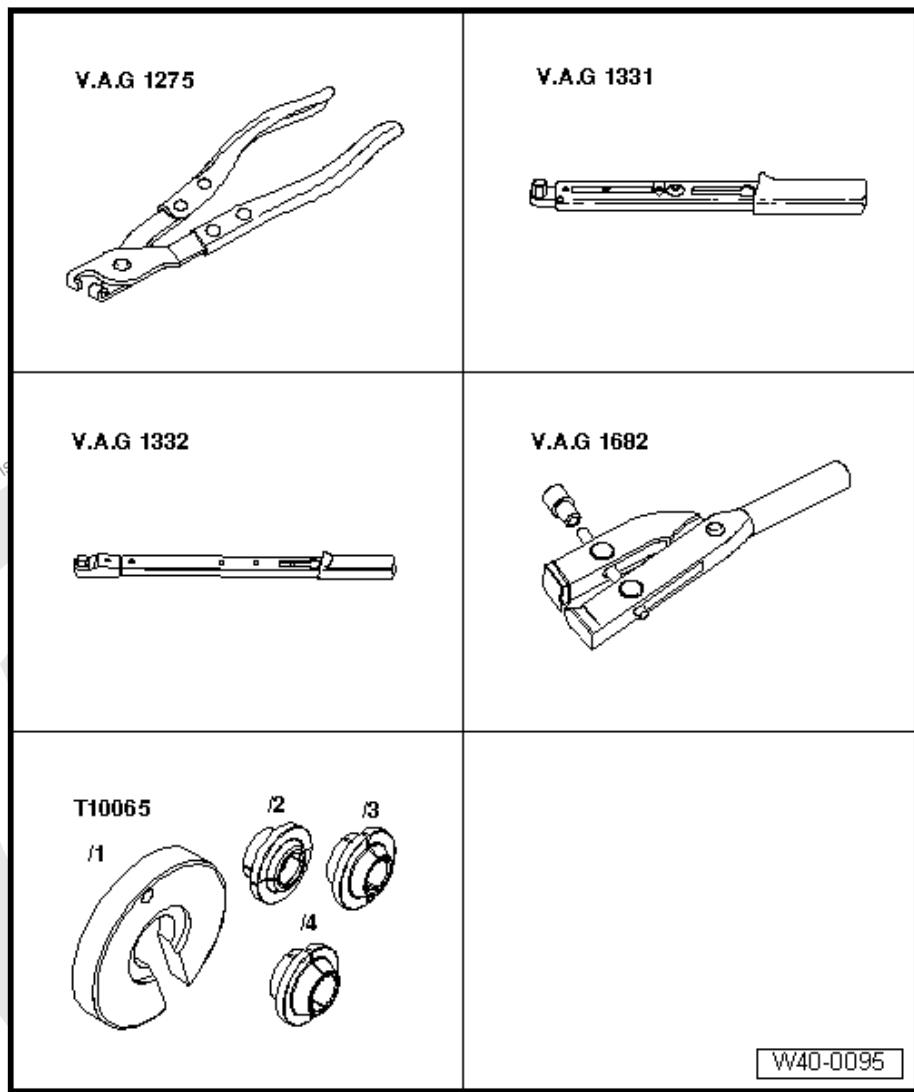
II - Twelve-Point Bolt without Ribs -arrow B-

10.1 Drive Axle with Triple Roller Joint AAR3300i, Disassembling and Assembling

Special tools and workshop equipment required



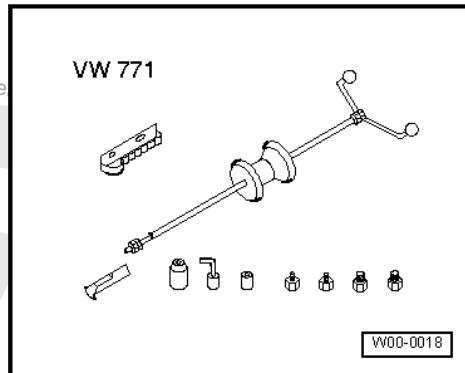
- ◆ Press Plate -VW 401-
- ◆ Press Plate -VW 402-
- ◆ Press Piece - Rod -VW 408 A-
- ◆ Press Piece - Rod -VW 411-
- ◆ Press Piece - 37mm -VW 416 B-
- ◆ Press Piece - Multiple Use -VW 447 H-



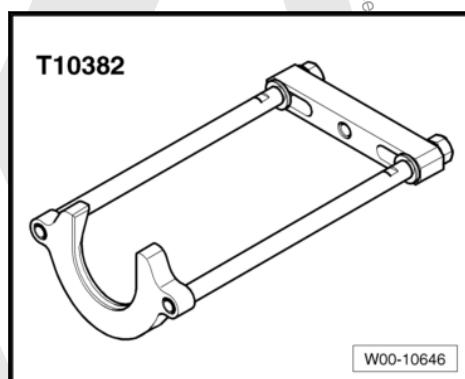
- ◆ Hose Clip Pliers -V.A.G 1275A-
- ◆ Torque Wrench, 6-50Nm -VAG 1331A-
- ◆ Torque Wrench, 40-200Nm -V.A.G 1332A-
- ◆ Clamping Pliers -V.A.G 1682A-
- ◆ Tripod Joint Tool -T10065-



◆ Slide Hammer Set -VW 771-

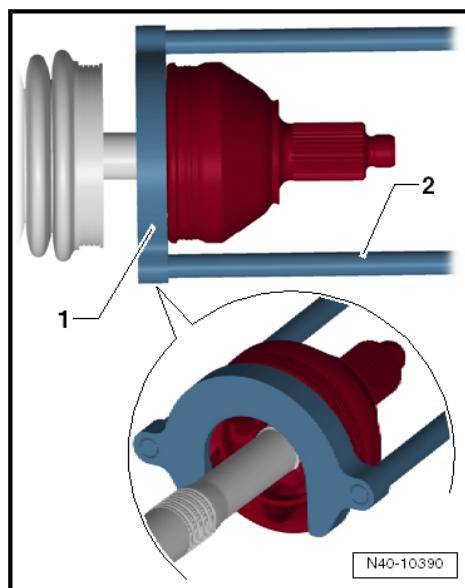


◆ Puller - Drive Axle -T10382-



Outer CV Joint, Removing

- Clamp the drive axle in a vise with jaw protectors.
- Fold back the boot.
- Align the Puller - Driveshaft -T10382- so that the flat side of the Puller - Driveshaft - Removing Plate -T10382/1- faces the Puller - Driveshaft - Spindles -T10382/2-.
- Attach the Puller - Drive Axle -T10382- to the Slide Hammer Set -VW 771-.
- Remove the CV joint from the drive axle using the Puller - Driveshaft -T10382- and Slide Hammer Set -VW 771-.



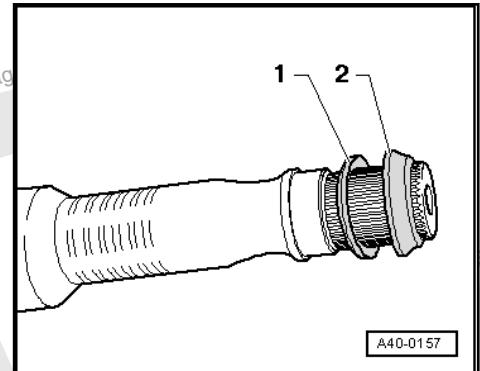
1 - Puller - Drive Axle - Removing Plate -T10382/1-



2 - Puller - Drive Axle - Spindles -T10382/2-

Outer CV Joint, Installing

Installed location of spring washer and thrust washer on outer joint



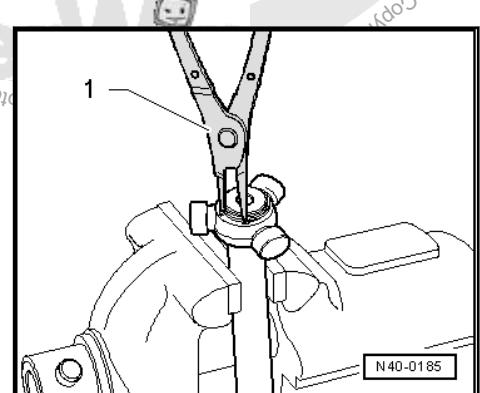
1 - Plate Spring

2 - Thrust Ring

- Install the new circlips.
- Slide the new CV boot onto the drive axle if necessary.
- Use a plastic mallet to install it on the shaft until the circlip engages.

Disassembling

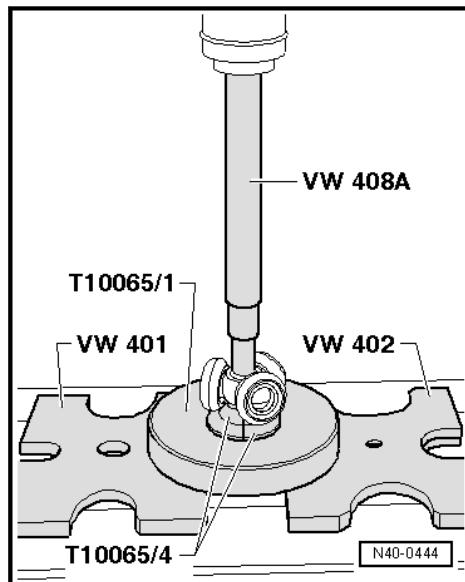
- Open both clamps at the inner joint and slide back the CV boot.
- Remove the joint from the drive axle.
- Remove the circlip.



1 - Pliers (Commercially Available)

- or Circlip Pliers -VW 161 A-

- Insert the drive axle into the press.
- Press the triple roller star off of the drive axle.



- Pull off CV boot from shaft.
- Clean the shaft, joint and groove for the seal.

Assembling

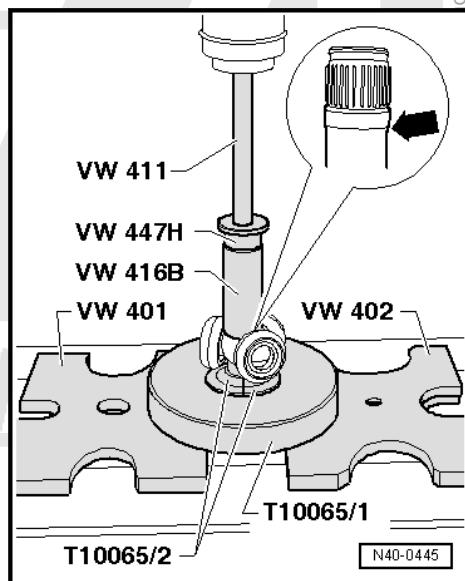
- Slide the small clamp for the CV boot onto the shaft.
- Slide the CV boot onto the shaft.
- Slide the joint piece onto the shaft.

Triple Roller Star, Mounting

Conical drive axle version

The bevel on the star faces toward shaft, this is used as an assembly aid.

- Connect triple roller star on the shaft and press on up to the stop.



- Make sure that pressure does not increase above 3.0 t!
- If necessary, coat the splines of the drive axle and triple roller star with lubricant G 052 142 A2.



- Insert the circlip while making sure it is seated correctly.

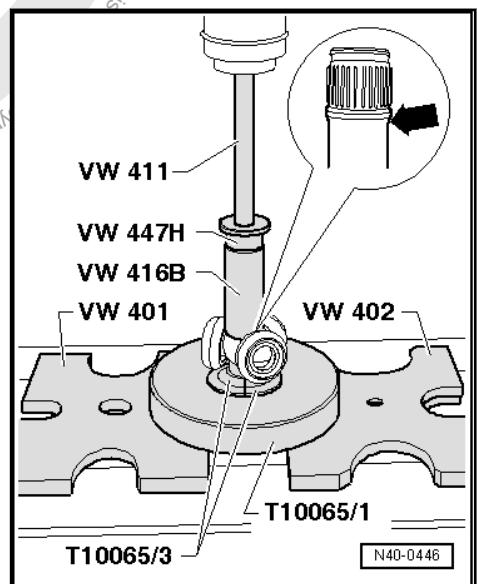
From 08/2004, a different grease will be used in the triple roller joints. The grease must not be mixed with grease previously used. Therefore, the triple roller joint must be cleaned before greasing when performing service work.

- Press 70 grams of drive axle grease from the repair set into the triple roller joint.
- Slide the joint piece over rollers and secure.
- Press 60 grams of joint grease from the repair set into the back side of the triple roller joint.
- Install the CV boot.

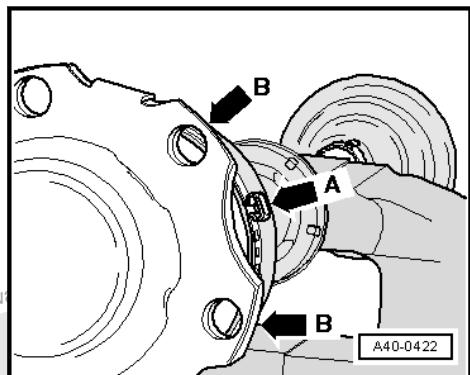
Triple Roller Star, Mounting

Cylindrical drive axle version

- Connect triple roller star on the shaft and press on up to the stop.



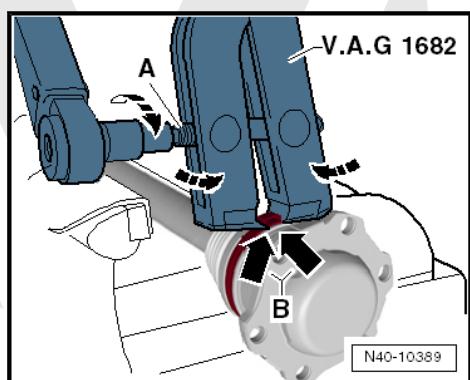
- Make sure that pressure does not increase above 3.0 t!
- If necessary, coat the splines of the drive axle and triple roller star with Grease -G 052 142 A2-.
- Insert the circlip while making sure it is seated correctly.
- Press 70 grams of drive axle grease from the repair set into the triple roller joint.
- Slide the joint piece over rollers and secure.
- Press 60 grams of joint grease from the repair set into the back side of the triple roller joint.
- Install the CV boot.
- Install the clamp.



Note

To thread the internal multi-point bolts more easily when installing the drive axle, it is necessary that the clamping tab on the clamp -arrow A- is between the flanges on the joint -B arrows-.

Tightening the tensioning clamps on the larger diameter on the inner joint.

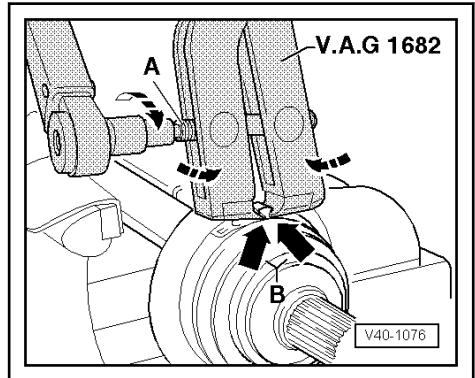


- Attach the Clamping Pliers -V.A.G 1682A- as shown. When doing this, make sure that edges of the pliers are positioned in the corners -B arrows- of the clamp.
- Tension the clamp by turning spindle with a torque wrench (without tilting the pliers).

Note

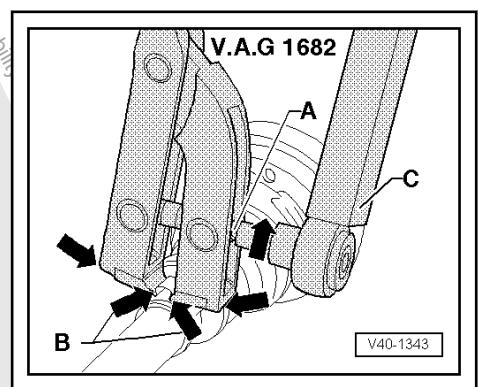
- ◆ The hard material of the CV boot (compared to rubber) makes it necessary to use a stainless steel hose clamp. It is only possible to tighten the clamp using Clamping Pliers -V.A.G 1682A-.
- ◆ Tightening specification: 25 Nm.
- ◆ Use the torque wrench -C- with adjustment range 5 to 50 Nm (for example, Torque Wrench 5-50Nm -V.A.G 1331-).
- ◆ Make sure the spindle threads -A- on the pliers move easily. Lubricate with MOS 2 grease, if necessary.
- ◆ If difficult to tighten, for example because of dirty threads, the proper clamping force of the clamping sleeve will not be reached even when tightened to the specification.

Tightening clamp on the outer joint



- Attach Clamping Pliers -V.A.G 1682- as shown in illustration. Be sure that edges of the pliers are in the corners -B arrows- of the hose clamp.
- Tension the clamp by turning spindle with a torque wrench (without tilting the pliers).

Tightening the tensioning clamp on the smaller diameter on the inner/outer joint





42 – Rear Suspension

1 Vehicles Involved in Collisions, Evaluating

For a check list for assessing the suspension on vehicles involved in a collision, Refer to [L1 ist, Assessing the Suspension on Vehicles Involved in a Collision](#), page 1.





2 Rear Suspension, FWD, Servicing

⇒ [-2.1 Rear Axle", page 141](#)

⇒ [A2.2 xle in Curb Weight Position", page 142](#)

2.1 Overview - Rear Axle

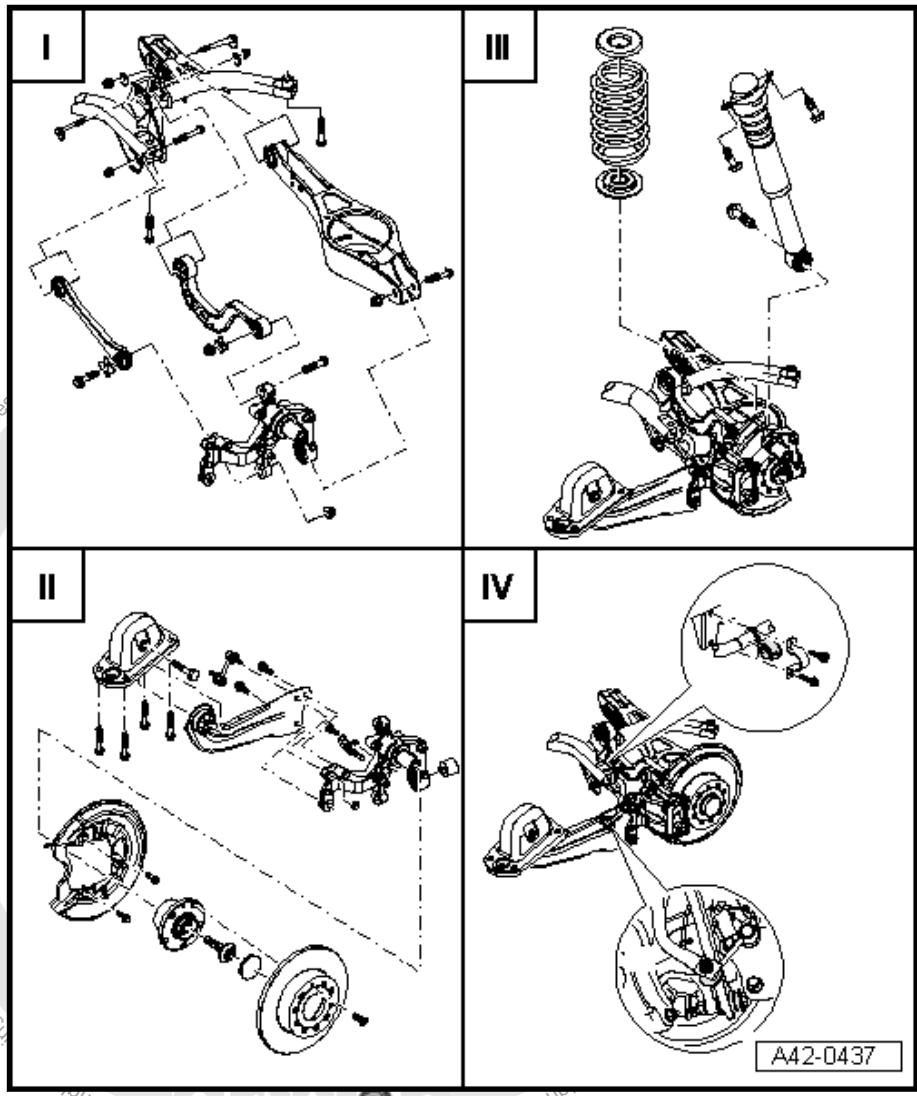
I - ⇒ [-3 Subframe, Transverse Link and Tie Rod, FWD", page 145](#)

II - ⇒ [-4 Wheel Bearing Housing, Trailing Arm, FWD", page 168](#)

III - ⇒ [-5 Shock Absorber and Coil Spring", page 192](#)

IV - ⇒ [-6 Stabilizer Bar", page 200](#)

Using for private or commercial purposes, in part or in whole, is not permitted unless



A42-0437



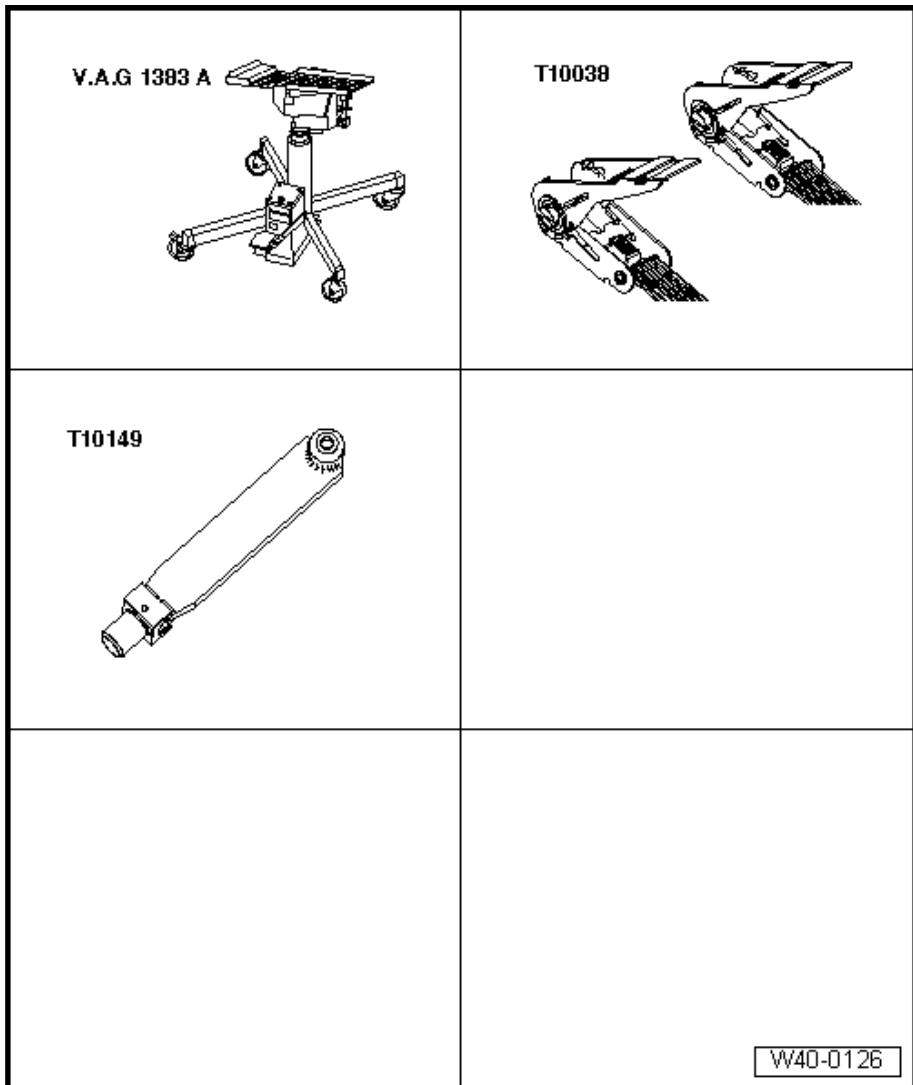
Note

- ◆ Welding and alignment work on supporting and wheel carrying suspension components is not permitted.
- ◆ Always replace self-locking nuts.
- ◆ Always replace corroded bolts/nuts.
- ◆ Bonded rubber bushings have a limited range of rotation. Therefore tighten threaded connections at components with bonded rubber bushings only when wheel bearing housing has been lifted (curb weight position). Refer to ⇒ [A2.2 xle in Curb Weight Position", page 142](#).



2.2 Rear Axle in Curb Weight Position

Special tools and workshop equipment required



- ◆ Engine and Gearbox Jack -VAS 6931-
- ◆ Tensioning Strap -T10038-
- ◆ Engine/Gearbox Jack Adapter - Wheel Hub Support - T10149-



All bolts at suspension parts with bonded rubber bushings must always be tightened in curb weight position (unloaded condition).

Bonded rubber bushings have a limited range of rotation.

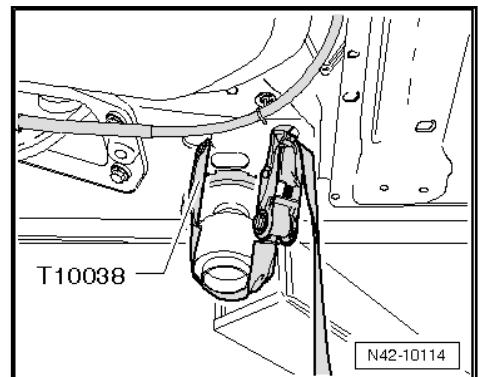
Axle components with bonded rubber bushings must be brought into the position they will be in when driving before they are tightened (curb weight position).

Otherwise, the bonded rubber bushing will have tension, which will reduce the service life.



By raising the axle on one side using Engine and Gearbox Jack -VAS 6931- and Engine/Gearbox Jack Adapter - Wheel Hub Support -T10149-, this position can be simulated on the hoist.

Before lifting the axle on one side, the vehicle must be secured to the lift arms of the lift using the Tensioning Strap -T10038-.

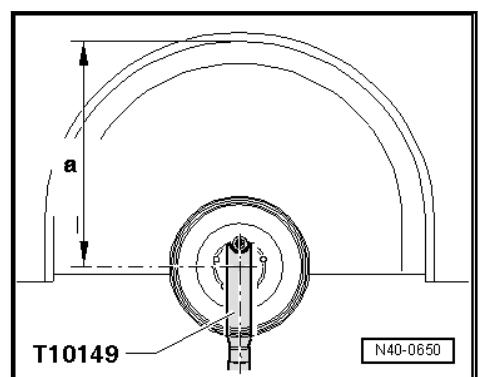


WARNING

There is a risk that the vehicle could fall off the hoist if it is not secured.

- Turn the wheel hub far enough until one of the holes for the wheel bolts is at the top.
- Install the Engine/Gearbox Jack Adapter - Wheel Hub Support -T10149- with the wheel bolt.

The applicable bolts/nuts must only be tightened when dimension -a- between the center of the wheel hub and the lower edge of the wheel housing has been reached.



The dimension -a- is dependent on the height of the installed suspension:

Chassis 1)	Height -a- in mm
Basic suspension (2UA)	380 ± 10 mm
Heavy duty suspension (2UB)	400 ± 10 mm
Sport suspension except 18" wheels (2UC)	365 ± 10 mm
Sport suspension with 18" wheels (G02/G05/G07/2UC)	365 ± 10 mm



Suspension, USA and Canada 1)	Height -a- in mm
Basic suspension (2UA)	380 ± 10 mm
Sport suspension (2UC)	380 ± 10 mm

Suspension, Mexico 1)	Height -a- in mm
Base suspension (2UD)	390 ± 10 mm

1) The type of vehicle suspension is indicated on the vehicle data label. The suspension is indicated by a PR number. To determine which PR number represents which suspension, Refer to [⇒ D8.11 ata Label](#), page 353 .

- Raise the wheel bearing housing using the Engine and Gearbox Jack until the dimension -a- is reached.



WARNING

- ◆ *Do not lift or lower the vehicle when the Engine and Gearbox Jack is under the vehicle.*
- ◆ *Do not leave the engine/transmission jack under the vehicle any longer than necessary.*

- Tighten the applicable bolts and nuts.
- Lower the wheel bearing housing.
- Remove the Engine and Gearbox Jack from under the vehicle.
- Remove the Engine/Gearbox Jack Adapter - Wheel Hub Support -T10149-.



3 Overview - Subframe, Transverse Link and Tie Rod, FWD

- ⇒ [-3.1 Left Rear Level Control System SensorG76, FWD", page 148](#)
- ⇒ [L3.2 eft Rear Level Control System SensorsG76, Removing and Installing, FWD", page 149](#)
- ⇒ [S3.3 ecuring", page 149](#)
- ⇒ [A3.4 xle, Lowering", page 151](#)
- ⇒ [A3.5 xle, Removing and Installing", page 155](#)
- ⇒ [T3.6 ransverse Link, Removing and Installing", page 160](#)
- ⇒ [T3.7 ransverse Link, Removing and Installing", page 163](#)
- ⇒ [R3.8 od, Removing and Installing", page 165](#)





1 - Eccentric Screw

- For camber adjustment
- Perform a vehicle alignment after loosening.
Refer to [A8 alignment](#), page 340 .

2 - Nut

- 95 Nm
- Self-locking
- Always replace if removed
- Always tighten the threaded connections in curb weight position.
Refer to [A2.2 xle in Curb Weight Position](#), page 142 .

3 - Eccentric Washer

- Inner hole with tab

4 - Eccentric Screw

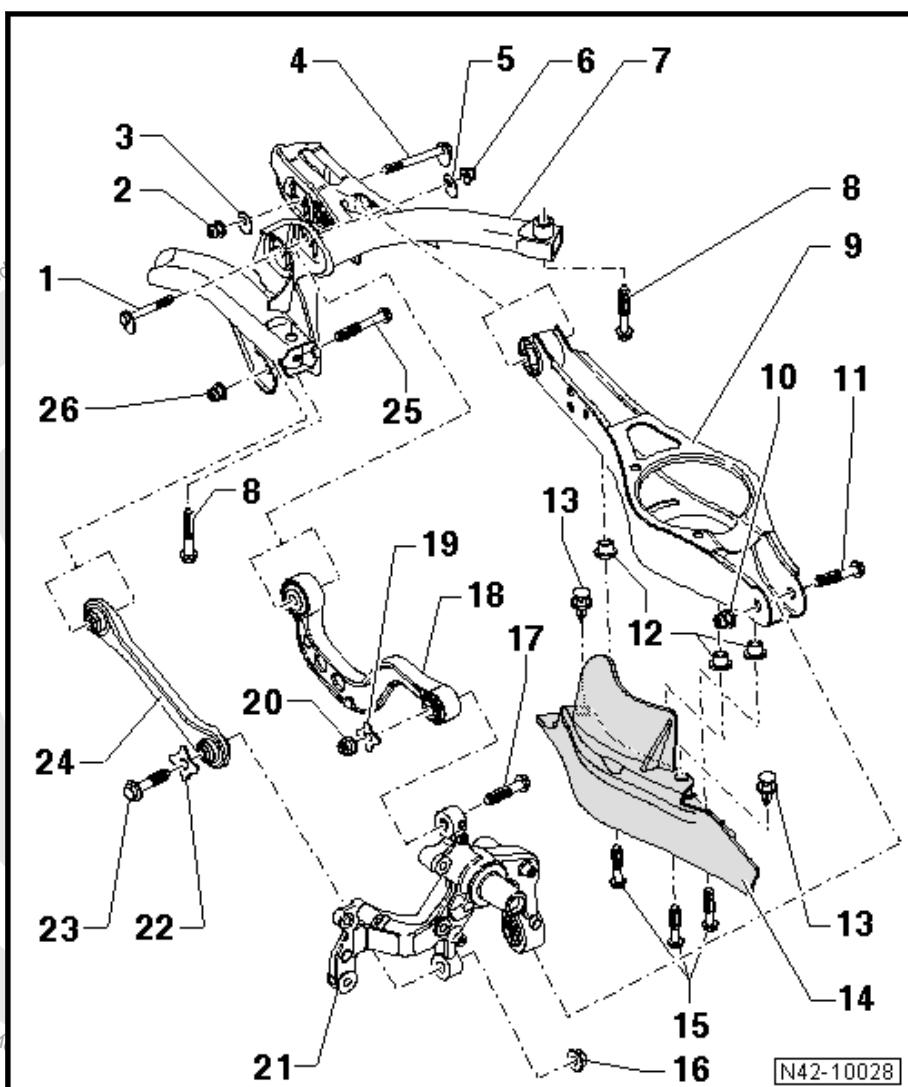
- For toe adjustment
- Perform a vehicle alignment after loosening.
Refer to [A8 alignment](#), page 340 .

5 - Eccentric Washer

- Inner hole with tab

6 - Nut

- 95 Nm



Note

- ◆ Adjust the Torque Wrench 40-200Nm -V.A.G 1332- to 80 Nm when tightening the nut.
- ◆ This tightening specification only applies when using Insert Tool T10179.

- Self-locking
- Always replace if removed
- Always tighten the threaded connections in curb weight position. Refer to [A2.2 xle in Curb Weight Position](#), page 142 .

7 - Subframe

8 - Bolt

- 70 Nm + 180° additional turn
- Always replace if removed

9 - Lower Transverse Link

- Removing and Installing. Refer to [T3.7 transverse Link, Removing and Installing](#), page 163 .

10 - Nut

- 70 Nm + 180° additional turn



- Self-locking
- Always replace if removed
- Always tighten the threaded connections in curb weight position. Refer to [⇒ A2.2 xle in Curb Weight Position](#), page 142 .

11 - Bolt

- Always replace if removed

12 - Rivet

- M6

13 - Expanding Rivet

14 - Stone Chip Protection

- Allocation. Refer to the ⇒ Electronic Parts Catalog (ETKA).

15 - Bolt

- 8 Nm

16 - Nut

- Self-locking
- Always replace if removed
- Always tighten the threaded connections in curb weight position. Refer to [⇒ A2.2 xle in Curb Weight Position](#), page 142 .

17 - Bolt

- 130 Nm + 180° additional turn
- Always replace if removed
- Always tighten the threaded connections in curb weight position. Refer to [⇒ A2.2 xle in Curb Weight Position](#), page 142 .

18 - Upper Transverse Link

- Removing and Installing. Refer to [⇒ T3.6 ransverse Link, Removing and Installing](#), page 160 .

19 - Washer

20 - Nut

- Self-locking
- Always replace if removed
- Always tighten the threaded connections in curb weight position. Refer to [⇒ A2.2 xle in Curb Weight Position](#), page 142 .

21 - Wheel Bearing Housing

- Removing and Installing. Refer to [⇒ B4.1 earing Housing, Removing and Installing](#), page 170 .

22 - Washer

23 - Bolt

- 130 Nm + 180° additional turn
- Always replace if removed
- Always tighten the threaded connections in curb weight position. Refer to [⇒ A2.2 xle in Curb Weight Position](#), page 142 .

24 - Tie Rod

- Different versions
- ◆ Closed in direction of travel (the right and left tie rods are different)
- ◆ Opened downward (the right and left tie rods are the same)
 - It is possible to interchange
 - Allocation. Refer to the ⇒ Electronic Parts Catalog (ETKA).
 - Removing and Installing. Refer to [⇒ R3.8 od, Removing and Installing](#), page 165 .

25 - Bolt

- Always replace if removed



26 - Nut

- 70 Nm + 180° additional turn
- Self-locking
- Always replace if removed
- Always tighten the threaded connections in curb weight position. Refer to [⇒ A2.2 xle in Curb Weight Position](#), page 142 .

3.1 Overview - Left Rear Level Control System Sensor -G76-, FWD



Note

- ◆ *Level control system sensor is available as a replacement part only complete with the coupling rod and upper and lower retaining plates.*
- ◆ *Replacing with subframe installed. Refer to [⇒ L3.2 eft Rear Level Control System SensorsG76, Removing and Installing, FWD](#), page 149 .*
- ◆ *Headlamp Range Control Module -J431-*

1 - Subframe

2 - Lower Transverse Link

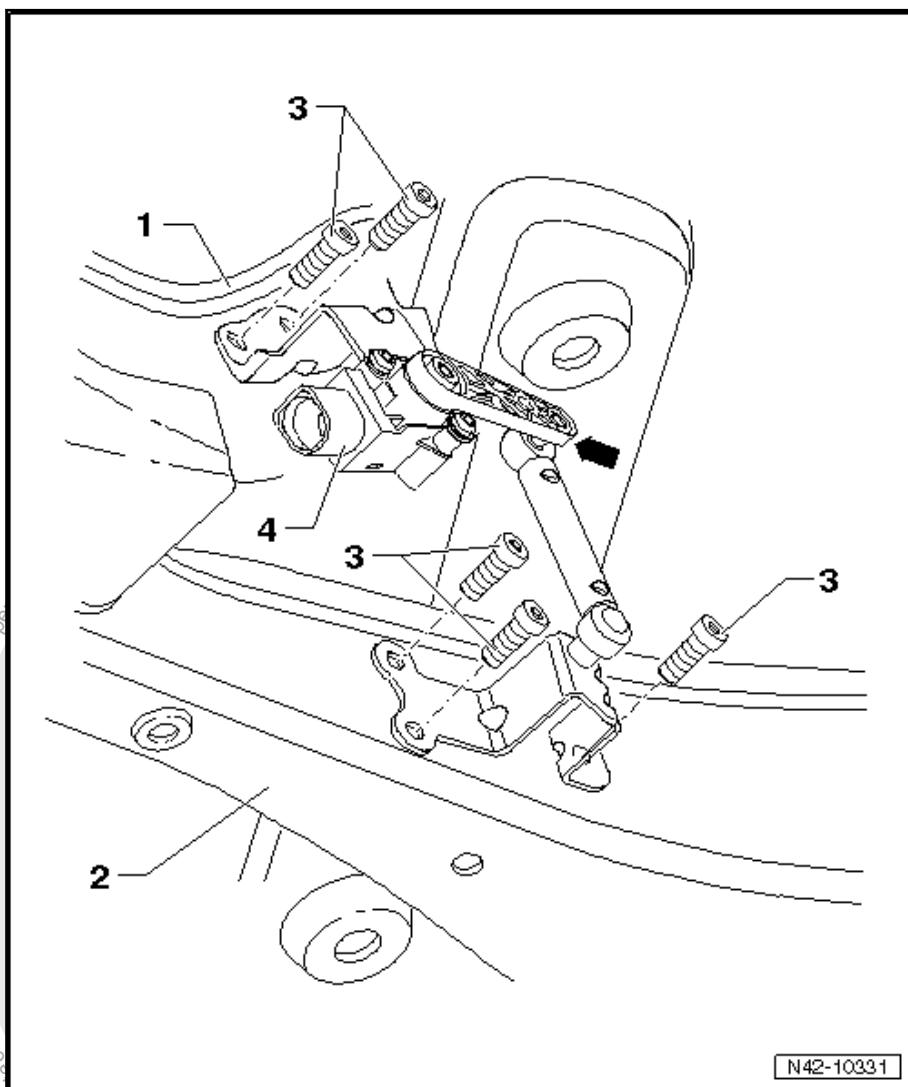
3 - Bolt

- M5 x 20
- 5 Nm

4 - Left Rear Level Control System Sensor -G76-

- Complete with attachments
- Lever -arrow- must point toward vehicle exterior
- Replace in vehicle. Refer to [⇒ L3.2 eft Rear Level Control System SensorsG76, Removing and Installing, FWD](#), page 149 .
- After replacing, perform a basic setting for the headlamps

Use the ⇒ Vehicle diagnostic tester for the headlamp basic setting

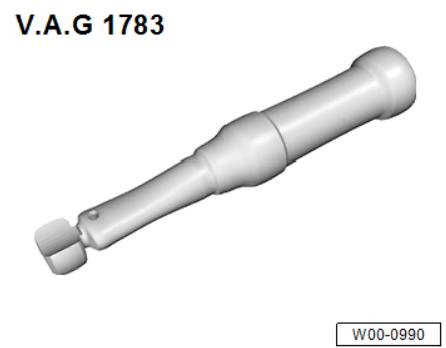




3.2 Left Rear Level Control System Sensors -G76-, Removing and Installing, FWD

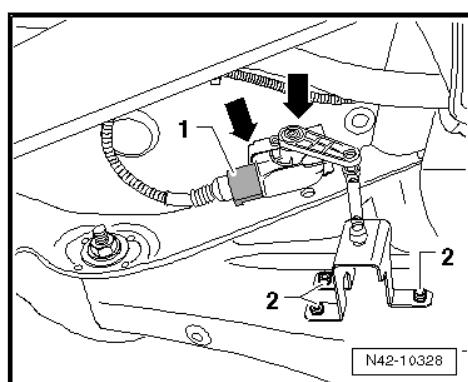
Special tools and workshop equipment required

- ◆ Torque Wrench 1783 - 2-10Nm -V.A.G 1783-



Removing

Disconnect the connector -1-.



- Remove the bolts -2- from the lower transverse link.
- Remove bolts -arrows- from the subframe.
- Remove Left Rear Level Control System Sensor -G76-.

Installing

Install in reverse order of removal. Note the following:

The Left Rear Level Control System Sensor -G76- lever must point toward the outside of the vehicle.

- Perform a basic setting on the headlamps after replacing them using the ⇒ Vehicle diagnostic tester.

Tightening Specifications

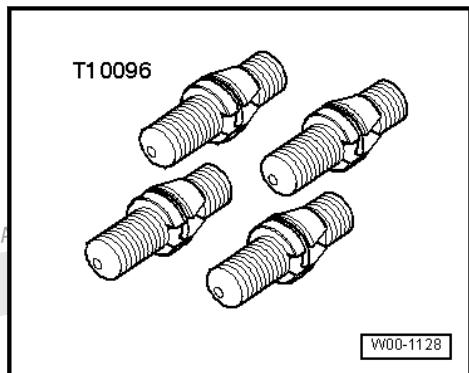
Component	Tightening Specification
Left Rear Level Control System Sensor -G76- to lower transverse link and subframe	5 Nm

3.3 Subframe, Securing

Special tools and workshop equipment required



◆ Locating Pins -T10096-

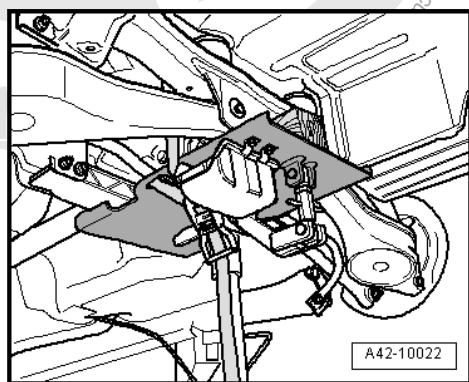


◆ Engine and Gearbox Jack -VAS 6931-

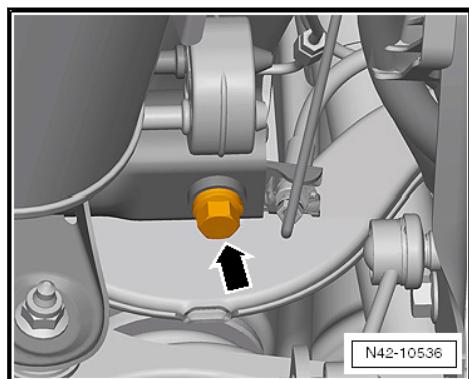


Locating Pins -T10096-, Installing

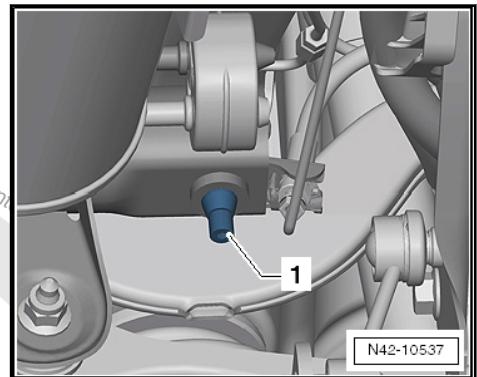
- Move the Engine and Gearbox Jack -VAS 6931- under the subframe and secure it using the tensioning strap.



- Unscrew one of the front bolts of the subframe -arrow-.



- Install the Locating Pins -T10096- -1-.



N42-10537



Note

Locating Pins -T10096- may only be tightened to a maximum of 20 Nm, otherwise the threads on the locating pins will be damaged.

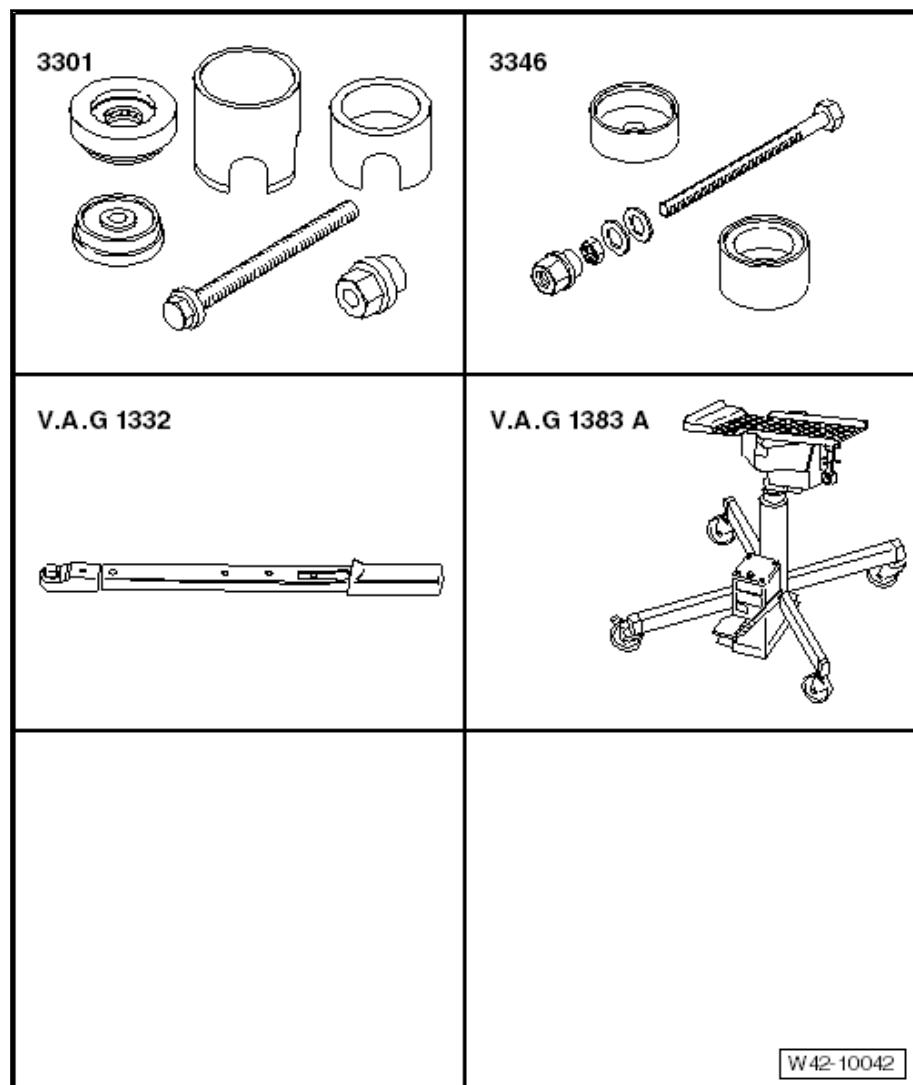
- The same procedure must be performed for the second front bolt of the subframe.

The subframe position is now secured.

3.4 Rear Axle, Lowering



Special tools and workshop equipment required



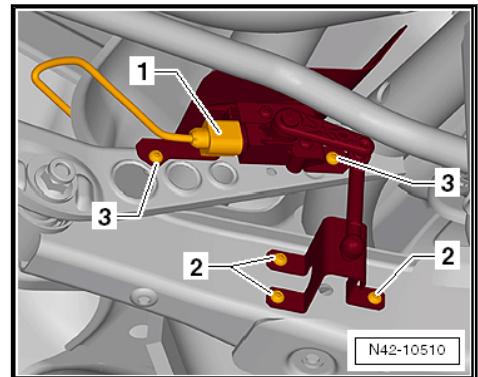
- ◆ Subframe Bushing Tool Kit -3301-
- ◆ Bearing Installer - Control Arm -3346-
- ◆ Torque Wrench, 40-200Nm -V.A.G 1332A-
- ◆ Engine and Gearbox Jack -VAS 6931-

Lower the subframe with attachments.

- Loosen the wheel bolts.
- Raise the vehicle.
- Remove the wheels.
- Remove the brake calipers on both sides of the vehicle and hang on the body.
- Remove the coil springs. Refer to [⇒ S5.1 spring, Removing and Installing](#), page 192 .
- Remove the rear muffler from the exhaust system. Refer to [⇒ Rep. Gr. 26; Exhaust Pipes/Mufflers; Overview - Muffler](#).

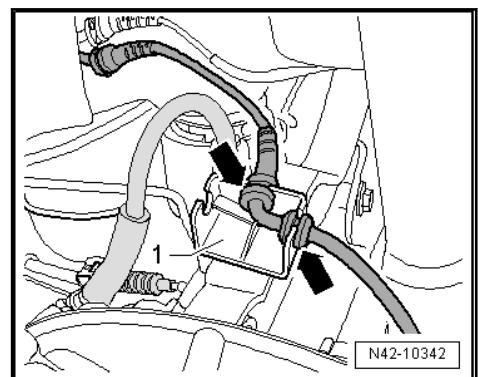
Vehicles with Left Rear Level Control System Sensor -G76-

- Disconnect the connector -1-.

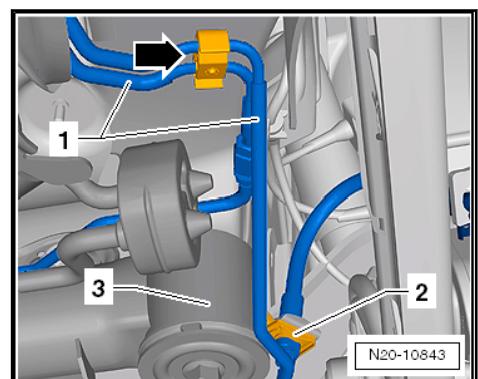


Continuation for all vehicles

- Unclip the speed sensor wire out of the bracket -1- -arrows-.



- Unclip the brake lines -1- from the bracket -arrow- on the left side of the body.



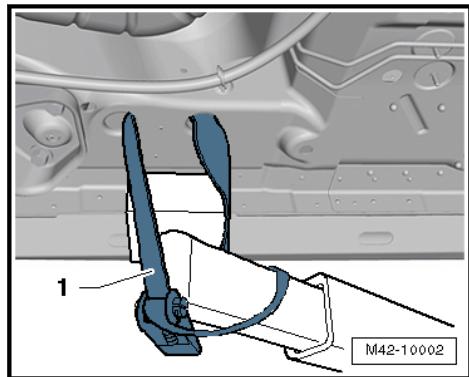
- Remove the clip -2- from the subframe -3- and loosen the brake hose from it.



Note

Do not disconnect the brake line.

- Secure both sides of the vehicle on the hoist lifting arms using the Tensioning Straps -T10038-.



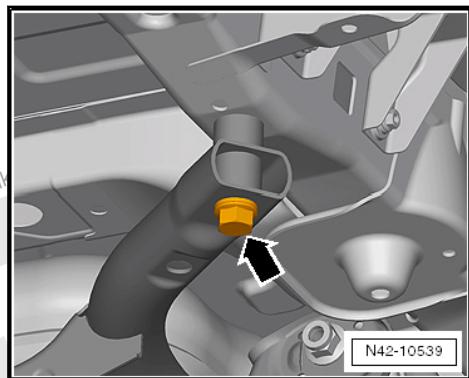
1 - Tensioning Strap -T10038-



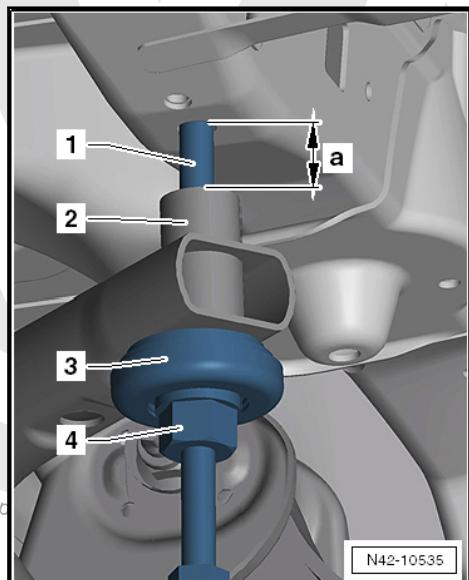
WARNING

The vehicle could slide off the hoist if it is not secured.

- Secure the subframe. Refer to [S3.3 ecuring](#), page 149 .
- Remove the bolt from the back of the subframe on the right side -arrow-.



- Install the Bearing Installer - Component -3346/2- with the Subframe Bushing Tool Kit -3301- and Nut Component -3346/3- into the threaded hole in the longitudinal member.





- 1 - Bearing Installer - Component Bearing Installer - Component -3346/2-
- 2 - Subframe
- 3 - Thrust bearing from Subframe Bushing Tool Kit -3301-
- 4 - Nut - Component Control Arm Bearing Installer - Nut -3346/3-
- Remove the left rear bolt from the subframe.
- Turn the nut Control Arm Bearing Installer - Nut -3346/3- on the spindle Bearing Installer - Component -3346/2- just enough to lower the subframe by -a- = 4 cm.

Subframe with Attachments, Installing

Install in reverse order of removal. Note the following:

- Install the wheels and tighten to the tightening specification. Refer to [M2 Counting Tightening Specifications](#), page 315 .

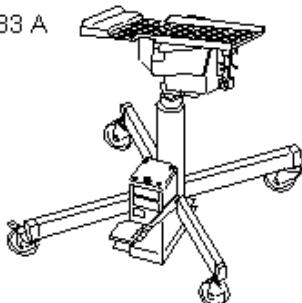
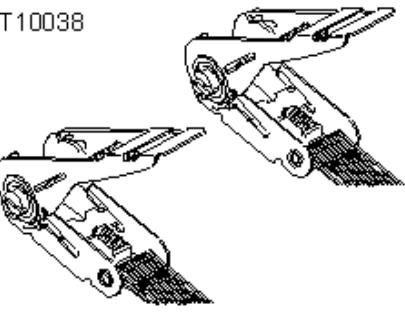
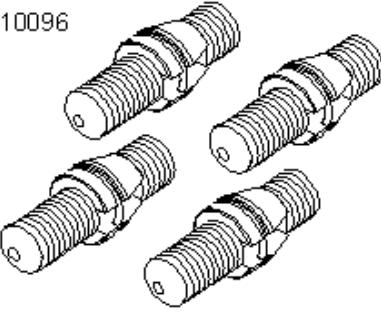
Tightening Specifications

Component	Tightening Specification
Subframe to body ◆ Use new bolts.	70 Nm + 180°

3.5 Rear Axle, Removing and Installing



Special tools and workshop equipment required

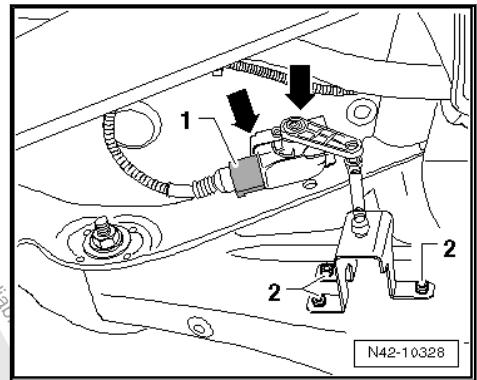
V.A.G 1332		V.A.G 1383 A	
T10038		T10096	

W42-10027

- ◆ Torque Wrench, 40-200Nm -V.A.G 1332A-
- ◆ Engine and Gearbox Jack -VAS 6931-
- ◆ Tensioning Strap -T10038-
- ◆ Locating Pins -T10096-

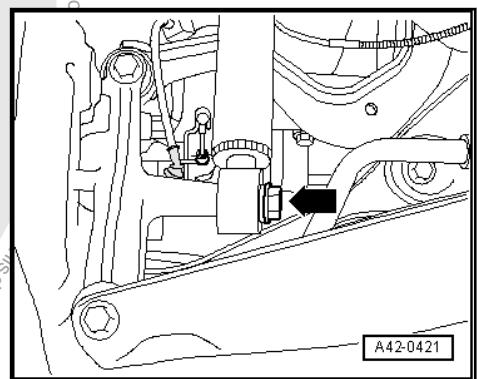
Removing the subframe and its attachments

- Remove the wheels.
- Remove the coil springs. Refer to [⇒ S5.1 pring, Removing and Installing](#), page 192 .
- Remove the front and rear mufflers on the exhaust system. Refer to ⇒ Motor ⇒ Rep. Gr. 26.
- On vehicles equipped with automatic headlamp range control, disconnect the connector -1-.

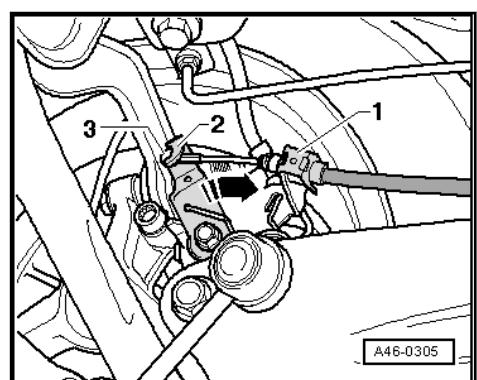


Remove ABS wheel speed sensor from wheel bearing housing.

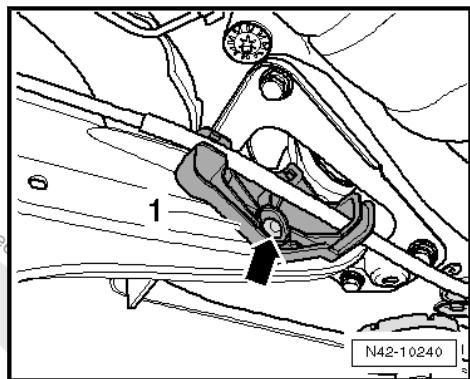
Remove the bolt -arrow-.



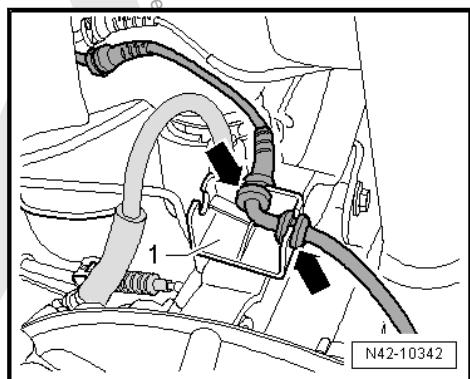
- Pry off the parking brake cable spring clamp -1-.



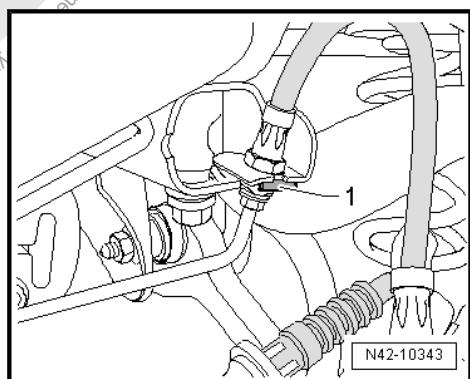
- Press the lever -2- in -direction of arrow- and unhook then parking brake cable -3-.
- Remove the bracket -1- by pressing out rivet inner pin -arrow-.



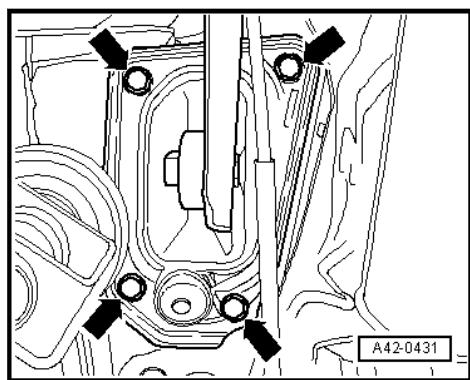
- Unclip the speed sensor wire out of the bracket -1- -arrows-.



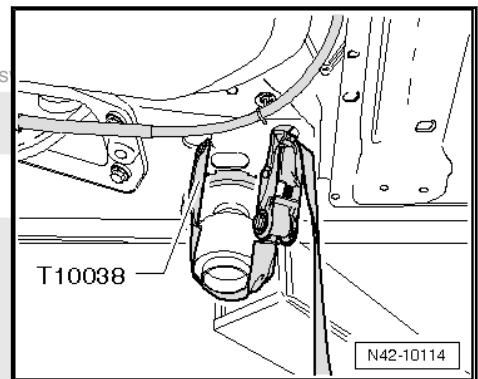
- Remove the hose bracket -1- on both sides of the vehicle.



- Mark the mounting bracket installation location on the body.



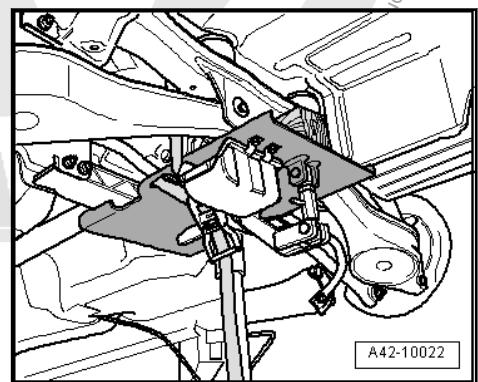
- Remove the bolts -arrows-.
- Now secure the vehicle on the hoist using Tensioning Straps - T10038 -.



WARNING

If a vehicle is not secured, there is danger that the vehicle could slip off the lift.

- Place the Engine and Gearbox Jack -VAS 6931- with the Universal Support Plate -V.A.G 1359/2- under the subframe and secure it with strap.



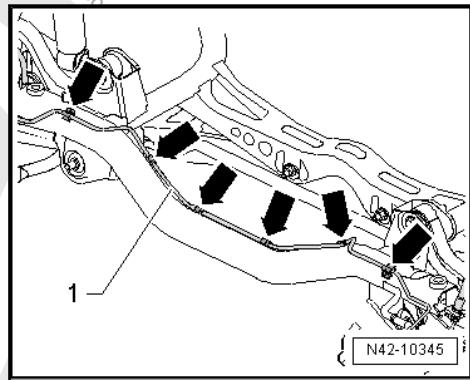
- Secure the subframe. Refer to [S3.3 securing](#), page 149 .
- Remove the 2 remaining bolts from the subframe.
- Carefully lower the subframe with its components 30 mm maximum.



Note

When lowering, ensure the brake lines and electrical lines have adequate clearance.

- Remove the brake line -1- from the clips -arrows-.



Note

- ◆ When doing this, the clips will be destroyed and must be replaced.
- ◆ For better illustration, the subframe is shown from above and is removed.

– Lower the subframe with attachments.

Subframe with Attachments, Installing

Install in reverse order of removal. Note the following:

- Perform a vehicle alignment. Refer to ⇒ [A8 Alignment](#), page [340](#).

Tightening Specifications

Component	Tightening Specification
Subframe to body ◆ Use new bolts.	70 Nm + 180°
Shock absorber to wheel bearing housing	180 Nm
Mounting bracket to body ◆ Use new bolts.	50 Nm + 45°
Parking brake cable to trailing arm. Refer to ⇒ Brake Systems; Rep. Gr. 46.	

3.6 Upper Transverse Link, Removing and Installing

Special tools and workshop equipment required

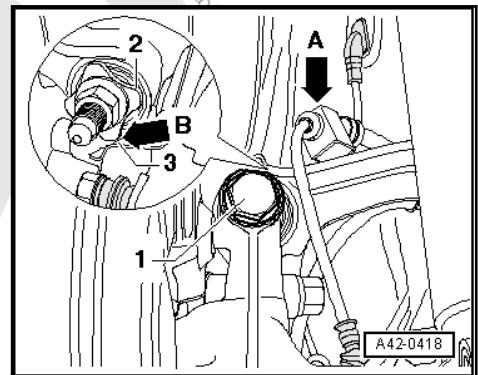
- ◆ Torque Wrench, 40-200Nm -V.A.G 1332A-



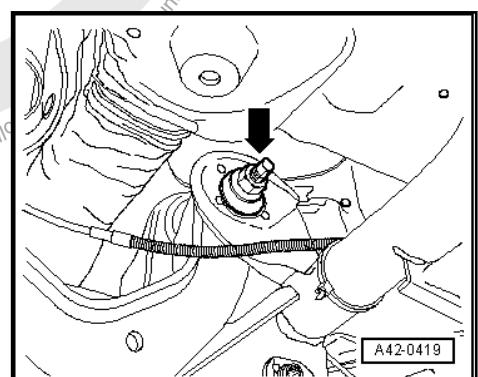


Removing

- Remove the wheel.
- Remove the coil spring. Refer to [S5.1 spring, Removing and Installing](#), page 192
- Unhook speed sensor wiring -arrow A- from the upper transverse link.



- Remove the bolt -1-.
- Mark, for example using a felt-tip marker, position of eccentric bolt -arrow- to subframe.



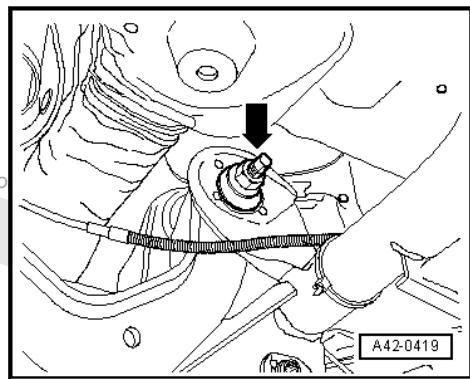
- Remove the bolt -arrow-.
- Remove upper transverse link.

Installing

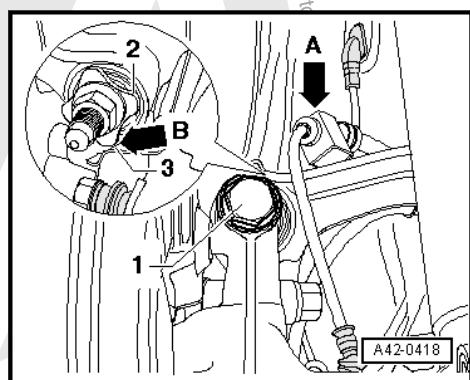
- Insert the upper transverse link into the vehicle and tighten the bolts by hand.
- Bring the rear axle to the curb weight position. Refer to [A2.2 axle in Curb Weight Position](#), page 142 .

Only bolt on transverse link if dimension "a" is reached! Refer to [Fig. "Measure dimension -a- "](#), page 209 .

- Bolt upper transverse link to subframe and tighten new nut.



- Note applied marking of the eccentric screw -arrow- to the subframe.
- Tighten the bolt -1- on the upper transverse link.



Note

Washer -2- must be installed so that there is a gap -arrow B- between washer and cover plate -3-.

- Hook speed sensor wiring -arrow A- in at the upper transverse link.
- Install the coil spring. Refer to [S5.1 pring, Removing and Installing](#), page 192 .
- Install the wheel and tighten. Refer to [M2 ounting Tightening Specifications](#), page 315 .
- Perform vehicle alignment. Refer to [A8 lignment](#), page 340 .

Tightening Specifications

Component	Tightening Specification
Upper transverse link to wheel bearing housing ◆ Use a new bolt and nut ◆ Tighten bolts in curb weight position	130 Nm + 180°
Upper transverse link to subframe ◆ Use a new nut ◆ Tighten bolts in curb weight position	95 Nm ◆ Adjust the Torque Wrench 40-200Nm -V.A.G 1332- to 80 Nm when tightening the nut. ◆ Only applies in conjunction with Insert Tool SW 18 -T10179-.



3.7 Lower Transverse Link, Removing and Installing

Special tools and workshop equipment required

- ◆ Torque Wrench, 40-200Nm -V.A.G 1332A-

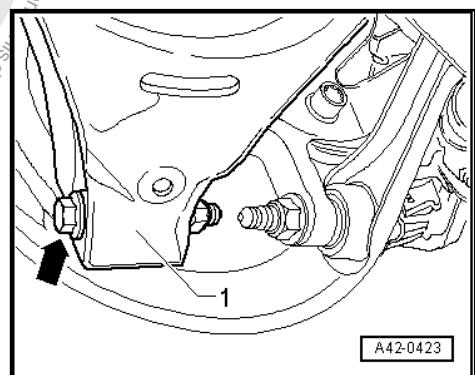
V.A.G 1332



W00-0428

Removing

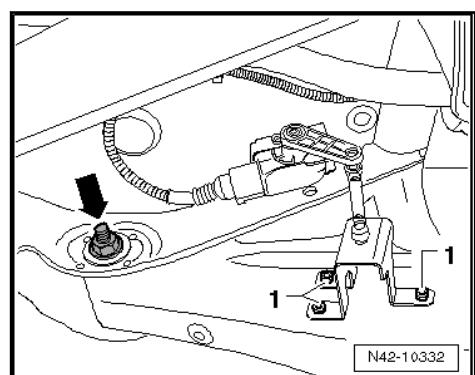
- Remove the wheel.
- Remove coil spring. Refer to [S5.1 pring, Removing and Installing](#), page 192 .
- Remove the bolt -arrow- for the lower transverse link -1-.



A42-0423

Vehicles with automatic headlamp range control

- Remove the bolts -1- from the lower transverse link.



N42-10332

Continuation for all vehicles

- Mark, for example using a felt-tip marker, position of eccentric bolt -arrow- to subframe.
- Disengage the rear exhaust system and lower.
- Remove the bolt -arrow-.



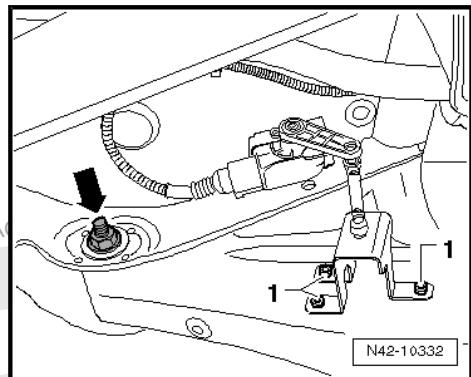
- Remove the lower transverse link.

Installing

- Insert lower transverse link into vehicle and tighten the bolts by hand.

Only bolt on transverse link if dimension "a" is reached! Refer to [⇒ page 143](#).

- Connect the upper transverse link to the subframe and tighten the new nut -arrow- to the tightening specification only.



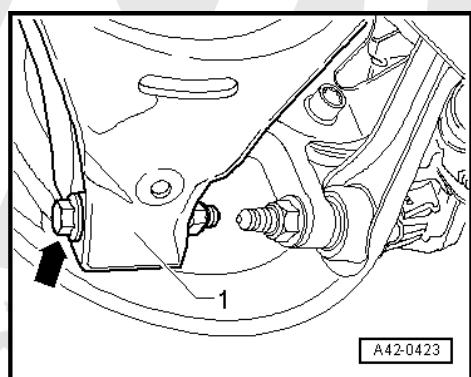
- Note applied marking of the eccentric screw -arrow- to the subframe.
- Suspend rear exhaust system.

Vehicles with automatic headlamp range control

- Install the bolts -1- to the lower transverse link.

Continuation for all vehicles

- Tighten bolt -arrow- for lower transverse link -1-.



- Install the coil spring. Refer to [⇒ S5.1 pring, Removing and Installing](#), page 192.
- Install the wheel and tighten. Refer to [⇒ M2 ounting Tightening Specifications](#), page 315.
- Perform vehicle alignment. Refer to [⇒ A8 lignment](#), page 340.

Tightening Specifications

Component	Tightening Specification
Lower transverse link to wheel bearing housing ◆ Use a new bolt and nut ◆ Tighten bolts in curb weight position	70 Nm + 180°



Component	Tightening Specification
Lower transverse link to subframe ◆ Use a new nut ◆ Tighten bolts in curb weight position	95 Nm

3.8 Tie Rod, Removing and Installing

Special tools and workshop equipment required

- ◆ Torque Wrench, 6-50Nm -VAG 1331A-

V.A.G 1331



W00-0427

- ◆ Torque Wrench, 40-200Nm -V.A.G 1332A-

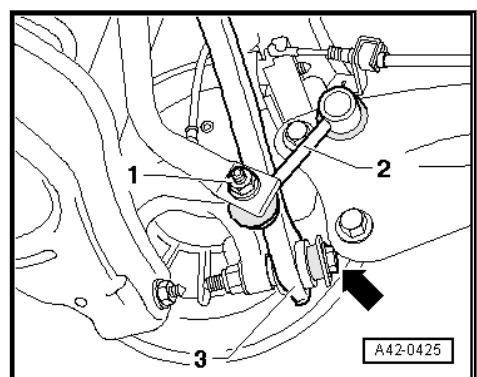
V.A.G 1332



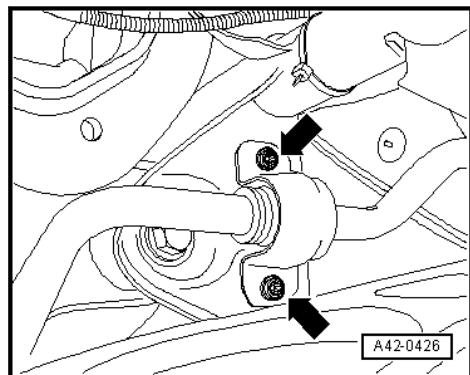
W00-0428

Removing

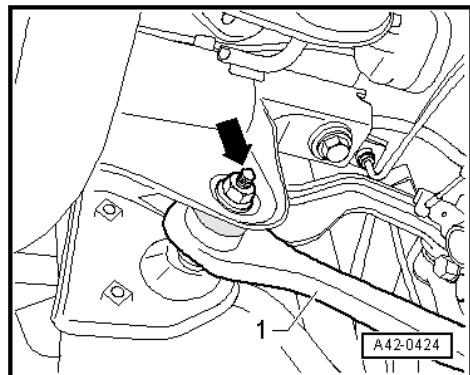
- Remove the wheel.
- Remove the coil spring [⇒ page 193](#).
- Remove the nut -1- and pull the coupling rod -2- out of the stabilizer bar.



- Remove the threaded connection -arrow- for tie rod -3-.
- Remove the bolts -arrows- for the stabilizer bar clamp.



- Remove the nut -arrow- and remove bolt toward rear.



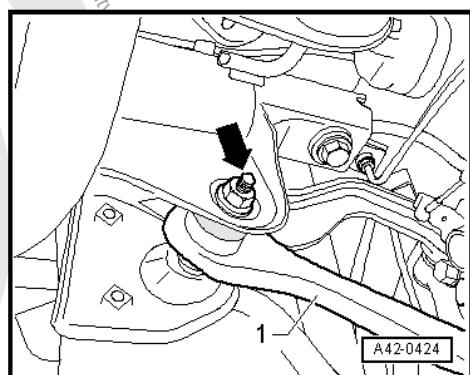
- Remove tie rod.

Installing

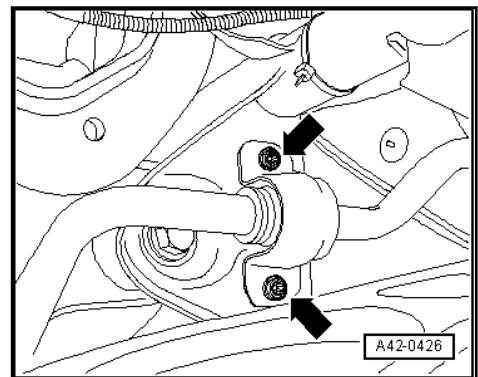
- Insert the tie rod in the vehicle with the opening facing down and tighten the bolts by hand.
- Bring the rear axle to the curb weight position. Refer to [A2.2 xle in Curb Weight Position](#), page 142 .

The threaded connections of the tie rod must only be fastened when the dimension "a" is achieved! Refer to [Fig. "Measure dimension -a- "](#), page 209 .

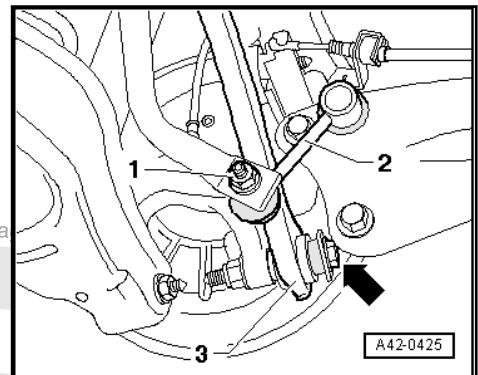
- Bolt tie rod to subframe and tighten new nut.



- Tighten bolts -arrows- for stabilizer clamp.



- Tighten the threaded connection -arrow- for the tie rod -3-.



- Insert coupling rod -2- into stabilizer and tighten nut -1-.
- Install the coil spring. Refer to [⇒ page 194](#).
- Install the wheel and tighten. Refer to [⇒ M2 Counting Tightening Specifications](#), page 315 .
- Perform vehicle alignment. Refer to [⇒ A8 Alignment](#), page 340 .

Tightening Specifications

Component	Tightening Specification
Tie rod to steering knuckle ◆ Use a new bolt and nut ◆ Tighten bolts in curb weight position	130 Nm + 180°
Tie rod to subframe ◆ Use a new bolt and nut	70 Nm + 180°
Stabilizer bar to subframe ◆ Use new bolts. ◆ Tighten bolts in curb weight position	20 Nm + 90°
Stabilizer bar to coupling rod ◆ Use a new nut	45 Nm



4 Overview - Wheel Bearing Housing, Trailing Arm, FWD

- ⇒ [B4.1 "earing Housing, Removing and Installing", page 170](#)
- ⇒ [B4.2 "earing Housing Bonded Rubber Bushing, Replacing", page 174](#)
- ⇒ [B4.3 "earing and Wheel Hub, Removing and Installing", page 178](#)
- ⇒ [B4.4 "earing Seal, Removing and Installing", page 182](#)
- ⇒ [A4.5 "rm with Mounting Bracket, Removing and Installing", page 184](#)
- ⇒ [A4.6 "rm, Servicing", page 188](#)



**1 - Bolt**

- 50 Nm + 45° additional turn
- Always replace if removed

2 - Cover**3 - Mounting Bracket****4 - Bolt**

- 90 Nm +90° additional turn
- Always replace if removed

5 - Coupling Rod

- Connects stabilizer bar to trailing arm/wheel bearing housing

6 - Bolt

- 90 Nm + 45° additional turn
- Follow the tightening sequence. Refer to [page 186](#).
- Always replace if removed

7 - Bolt

- 8 Nm

8 - Right Rear ABS Wheel Speed Sensor -G44-/Left Rear ABS Wheel Speed Sensor -G46-

- Can be checked in Guided Fault Finding using the \Rightarrow Vehicle diagnostic tester.
- Before inserting the sensor, clean the inner surface of the hole and coat with Grease -G 000 650-.

9 - Wheel Bearing Housing

- Removing and Installing. Refer to [B4.1 earing Housing, Removing and Installing](#), page 170 .

10 - Wheel Bearing Seal

- Allocation. Refer to the \Rightarrow Electronic Parts Catalog (ETKA).
- Removing and Installing. Refer to [B4.4 earing Seal, Removing and Installing](#), page 182 .

11 - Trailing Arm

- Removing and Installing. Refer to [A4.5 rm with Mounting Bracket, Removing and Installing](#), page 184 .
- Servicing. Refer to [A4.6 rm, Servicing](#), page 188 .

12 - Bonded Rubber Bushing

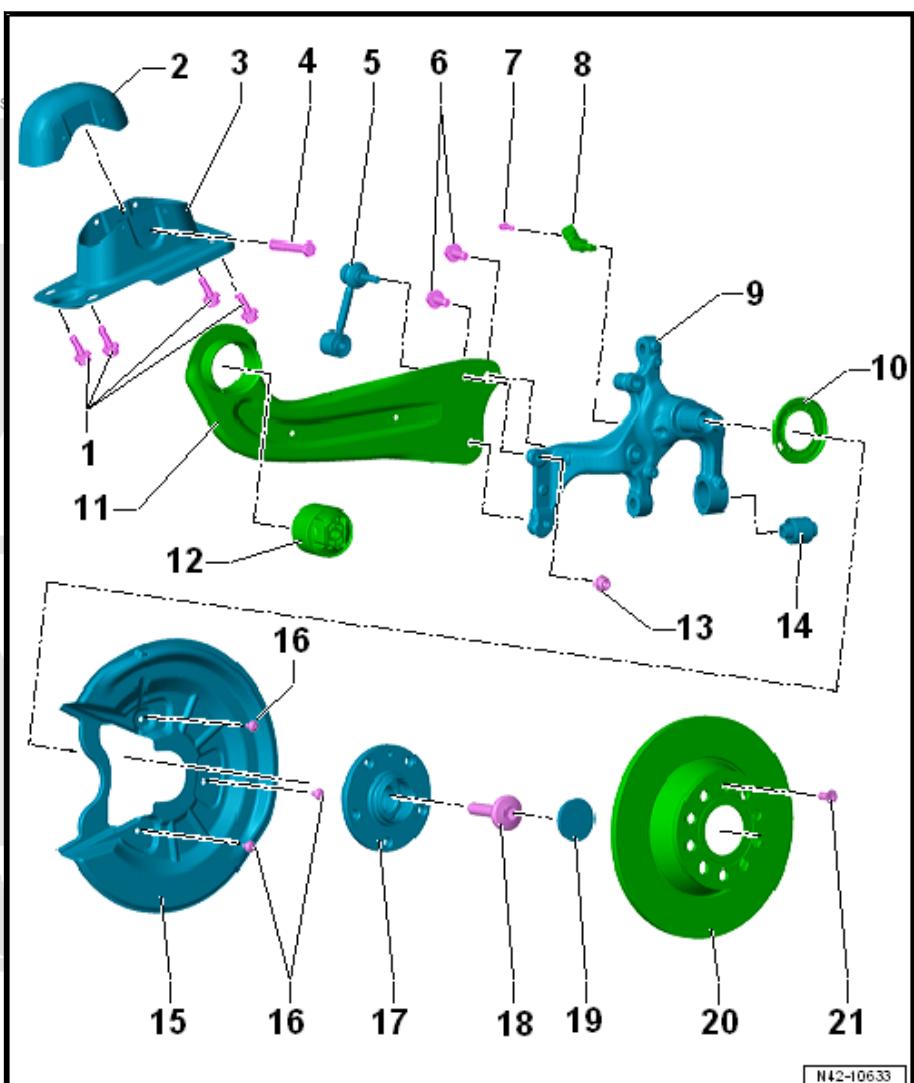
- Replacing. Refer to [A4.6 rm, Servicing](#), page 188 .

13 - Nut

- 45 Nm
- Always replace if removed

14 - Bonded Rubber Bushing

- Replacing. Refer to [B4.2 earing Housing Bonded Rubber Bushing, Replacing](#), page 174 .

15 - Cover Plate



16 - Bolt

- 12 Nm

17 - Wheel Hub with Wheel Bearing

- The ABS sensor ring is installed in the wheel bearing
- Removing and Installing. Refer to [B4.3 earing and Wheel Hub, Removing and Installing](#), page 178 .

The wheel bearing and wheel hub are installed together in a housing.

The wheel bearing unit is maintenance free and has zero play. Adjusting as well as repair work is not possible!

18 - Bolt

- 200 Nm + 180° additional turn
- Loosen and tighten using Socket - Xzn 18mm -T10162 A-
- Always replace if removed

19 - Dust Cap

- Always replace if removed
- Removing and Installing. Refer to [B4.3 earing and Wheel Hub, Removing and Installing](#), page 178 .

An appropriate seal can only be achieved with a new dust cap.

20 - Brake Rotor

21 - Bolt

- 8 Nm

4.1 Wheel Bearing Housing, Removing and Installing

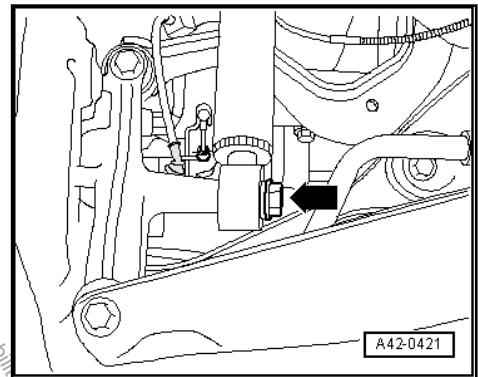
Special tools and workshop equipment required

- ◆ Torque Wrench, 40-200Nm -V.A.G 1332A-

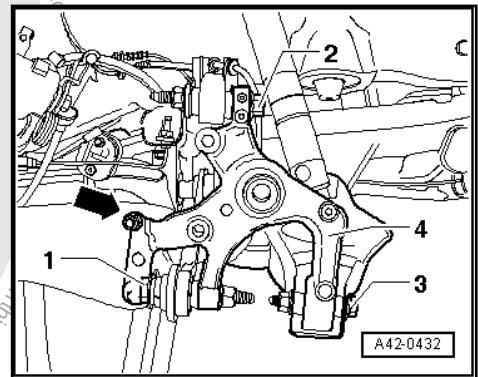


Removing

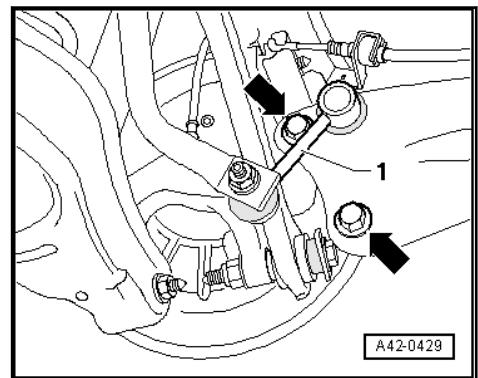
- Remove the wheel.
- Remove the coil spring. Refer to [S5.1 pring, Removing and Installing](#), page 192 .
- Remove wheel bearing/wheel hub unit. Refer to [B4.3 earing and Wheel Hub, Removing and Installing](#), page 178 .
- Remove the cover plate.
- Remove the Speed Sensor from the wheel bearing housing.
- Remove the bolt -arrow-.



Remove the threaded connection for the tie rod -1-, upper transverse link -2- and lower transverse link -3- from the wheel bearing housing -4-.



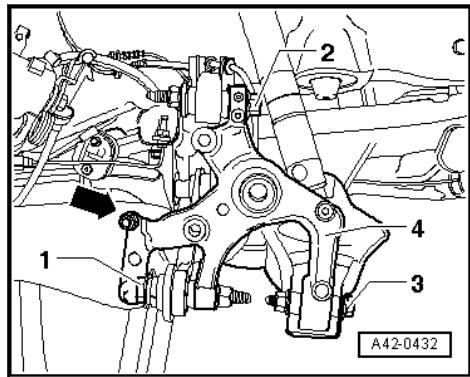
- Remove connecting link -arrow- from the wheel bearing housing.
- Hold wheel bearing housing tightly and remove the bolts -arrows-.



- Pull the coupling rod -1- out of the trailing arm.

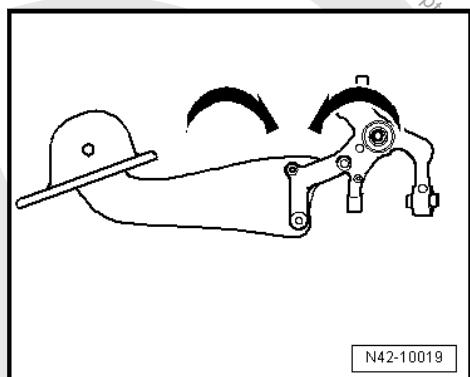
Installing

- Install the tie rod threaded connection -1-, upper transverse link -2- and lower transverse link -3-.



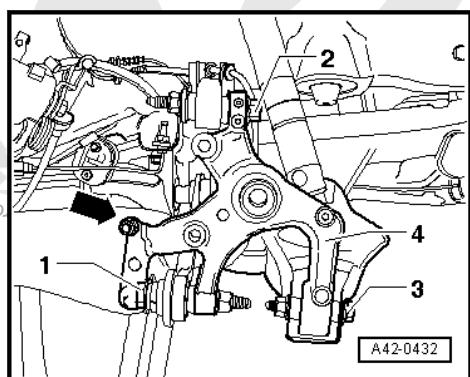
- Screw coupling rod -arrow- on wheel bearing housing hand-tight.

The trailing arm/wheel bearing housing threaded connection must only be tightened when all other components (especially the spring and strut) of the respective wheel suspension have already been assembled. To tighten, suspension must be unloaded. Only now do the trailing arm and wheel bearing housing move into the position required -arrows-.

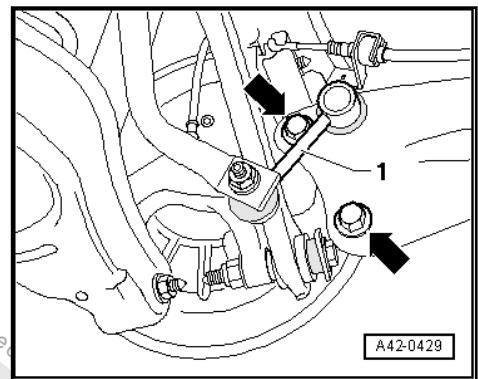


Always perform the following steps in the sequence given!

- Install the trailing arm and mounting bracket with bolts -2- on wheel bearing housing but do not yet tighten.



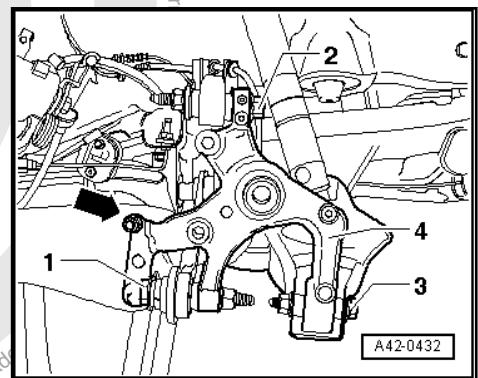
- Install the coil spring. Refer to [page 194](#).
- Install and fasten bolts -arrows-.



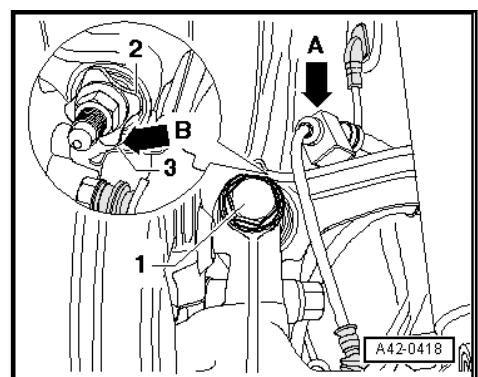
- Install the cover plate.
- Install wheel bearing/wheel hub unit.
- Bring the rear axle to the curb weight position. Refer to [A2.2 xle in Curb Weight Position](#), page 142 .

Only bolt on transverse link if dimension "a" is reached! Refer to [Fig. "Measure dimension -a-", page 209](#).

- Tighten bolt for tie rod -1-.



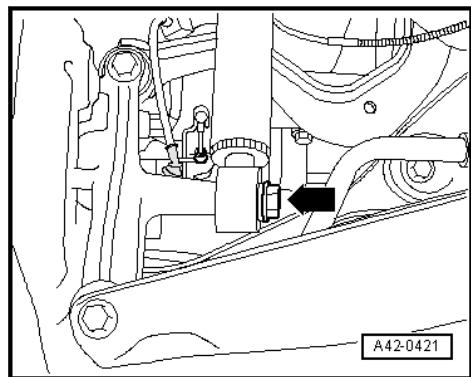
- Tighten the lower transverse link threaded connection -3-.
- Tighten the threaded connection -1- on the upper transverse link.



Note

Washer -2- must be installed so that there is a gap -arrow B- between washer and cover plate -3-.

- Tighten the bolt -arrow-.



- Install Speed Sensor into the wheel bearing housing.
- Install the brake rotor.
- Install the brake carrier with brake caliper. Refer to ⇒ Brake Systems; Rep. Gr. 46.
- Install the wheel and tighten. Refer to ⇒ [Mounting Tightening Specifications](#), page 315 .

Tightening Specifications

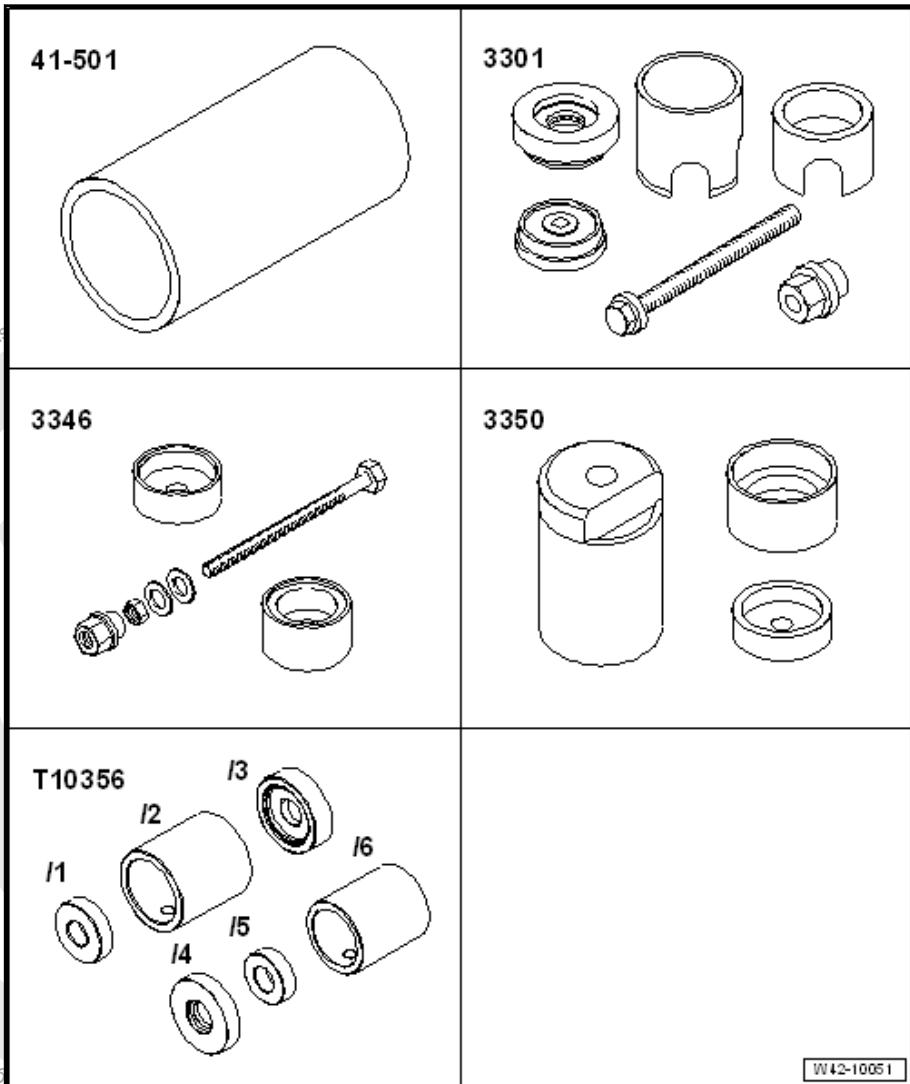
Component	Tightening Specification
Wheel bearing housing to upper transverse link ◆ Use a new bolt and nut ◆ Tighten bolts in curb weight position	130 Nm + 180°
Wheel bearing housing to lower transverse link ◆ Use a new bolt and nut ◆ Tighten bolts in curb weight position	70 Nm + 180°
Wheel bearing housing to tie rod ◆ Use a new bolt and nut ◆ Tighten bolts in curb weight position	130 Nm + 180°
Trailing arm to wheel bearing housing ◆ Use new bolts.	90 Nm + 45°
Connecting link to wheel bearing housing ◆ Use a new nut	45 Nm
Cover plate to wheel bearing housing	12 Nm
ABS speed sensor to wheel bearing housing	8 Nm
Shock absorber to wheel bearing housing	180 Nm
Brake rotor to wheel bearing housing	8 Nm

4.2 Wheel Bearing Housing Bonded Rubber Bushing, Replacing



Special tools and workshop equipment required

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- ◆ Press Tube -41-501-
- ◆ Subframe Bushing Tool Kit -3301-
- ◆ Bearing Installer - Control Arm -3346-
- ◆ Bearing Installer - Carrier Bearing -3350-
- ◆ Thrust Piece -T10356/5-
- ◆ Torque Wrench, 40-200Nm -V.A.G 1332A-

V.A.G 1332

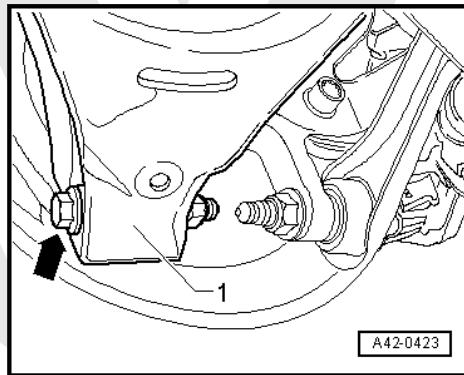


W00-0428



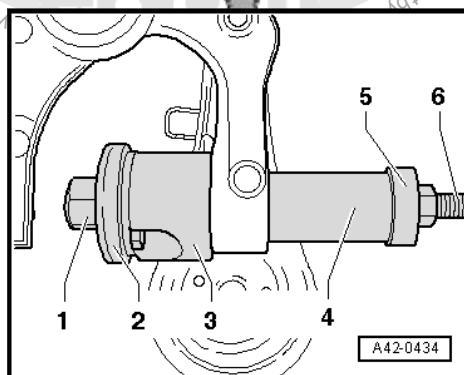
Removing

- Loosen the wheel bolts.
- Raise the vehicle.
- Remove the wheel.
- Remove the coil spring. Refer to [S5.1 Spring, Removing and Installing](#), page 192 .
- Remove the bolt -arrow- for the lower transverse link -1-.



Pressing out the bonded rubber bushing

- Mount the tools as shown in the illustration.

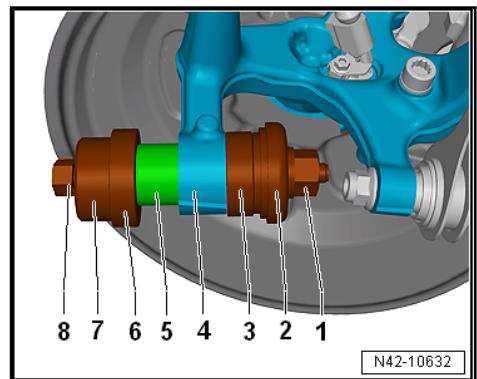


- 1 - Bearing Installer - Control Arm - Nut -3346/3-
- 2 - Subframe Bushing Tool Kit -3301-
- 3 - Subframe Bushing Tool Kit - Assembly Tool 3 -3301/3-
- 4 - Press Tube -41 - 501-
- 5 - Bearing Installer - Carrier Bearing - Thrust Piece -3350/1-
- 6 - Bearing Installer - Control Arm - Spindle -3346/2-
- Rotate the spindle to remove the bonded rubber bushing.

Installing

Bonded Rubber Bushing, Installing

- Mount the tools as shown in the illustration.



- 1 - Subframe Bushing Tool Kit - Nut -3301-
- 2 - Subframe Bushing Tool Kit -3301-
- 3 - Bearing Installer - Component -3346/2-
- 4 - Wheel Bearing Housing
- 5 - Bonded Rubber Bushing
- 6 - Thrust Piece -T10356/5-
- 7 - Subframe Bushing Tool Kit - Thrust Piece -3301/2-
- 8 - Subframe Bushing Tool Kit - Bolt -3301/1-
- Turn the spindle and pull the bonded rubber bushing into the wheel bearing housing -4-.

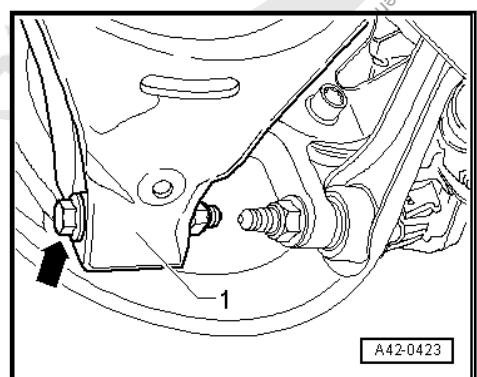


Note

- ◆ *Do not use lubricant!*
- ◆ *Insert the bearing carefully so that it is not tilted.*
- Install the cover plate.

The bolts on the wheel bearing housing may be installed only when dimension "a" has been reached. Refer to [⇒ A2.2 xle in Curb Weight Position](#), page 142 .

- Tighten bolt -arrow- for lower transverse link -1-.



- Install the coil spring. Refer to [⇒ S5.1 pring, Removing and Installing](#), page 192 .
- Install the wheel and tighten. Refer to [⇒ M2 ounting Tightening Specifications](#), page 315 .

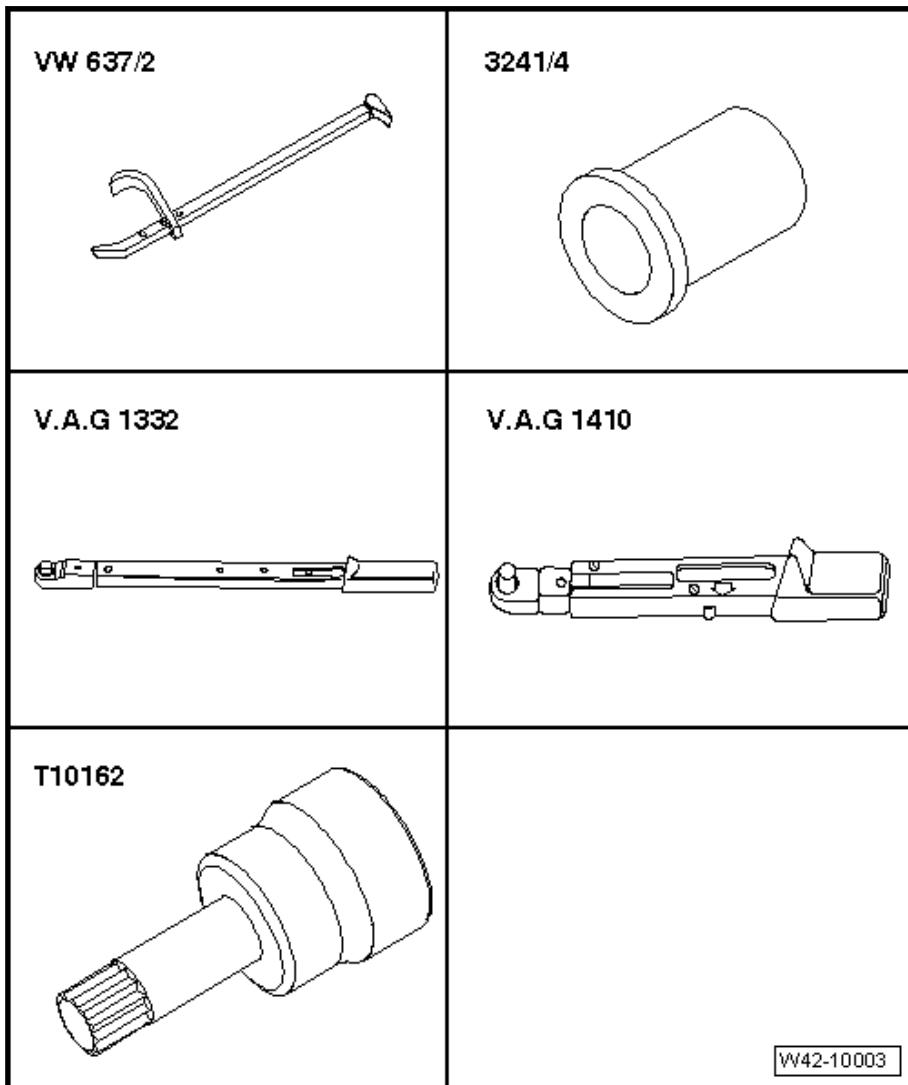


Tightening Specifications

Component	Tightening Specification
Wheel bearing housing to lower transverse link ◆ Use a new bolt and nut ◆ Tighten bolts in curb weight position	70 Nm + 180°
Cover plate to wheel bearing housing	12 Nm
Brake rotor to wheel bearing housing	8 Nm

4.3 Wheel Bearing and Wheel Hub, Removing and Installing

Special tools and workshop equipment required



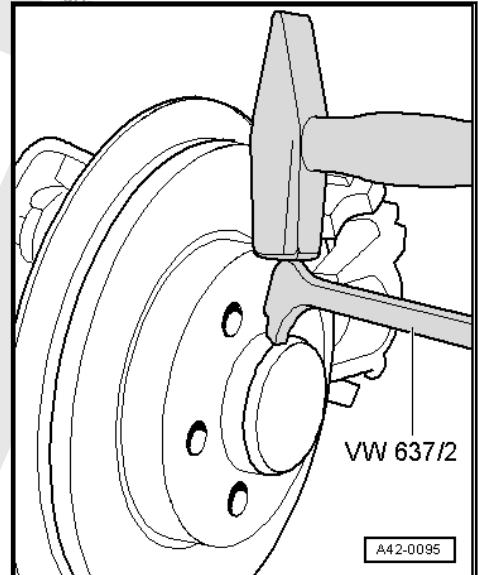
- ◆ Puller - Grease Cap -VW 637/2-
- ◆ Seal Installer - Camshaft Installer Kit -3241-
- ◆ Torque Wrench, 40-200Nm -V.A.G 1332A-
- ◆ Torque Wrench -V.A.G 1410-
- ◆ Socket - XZN 18mm -T10162 A-



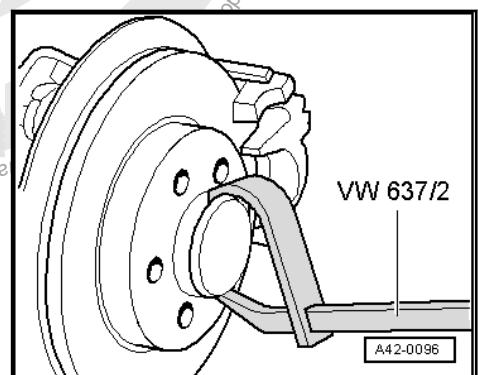
Removing

- Raise the vehicle.
- Remove the wheel.

Loosen the dust cap from its seat by tapping lightly on the claw
of Puller - Grease Cap -VW 637/2-.



- Press off the dust cap.



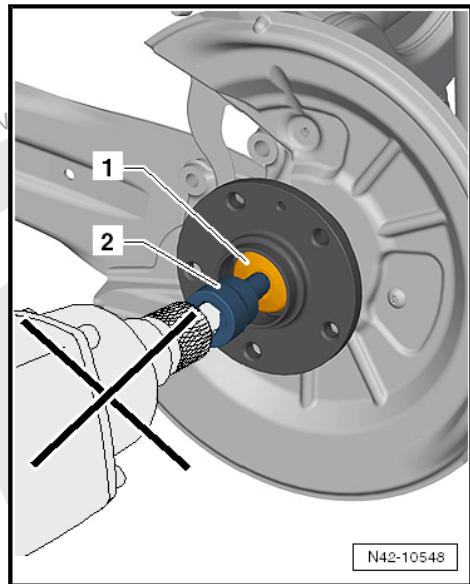
- Remove the brake carrier with the brake caliper and secure it on the body with wire. Refer to ⇒ Brake System; Rep. Gr. 46.



Note

Suspend the brake caliper from body.

- Remove the Phillips head screw for the brake rotor and then remove the brake rotor.
- Remove the bolt -1- using Socket - XZN 18mm -T10162 A-
-2-.



N42-10548



Caution

Never use an impact wrench when removing the bolt -1- using the Socket - XZN 18mm -T10162 A- -2-.

- Remove the wheel hubs/wheel bearing unit from the axle stub.

Installing

- Carefully slide the wheel hub/wheel bearing unit onto the axle stub.



Caution

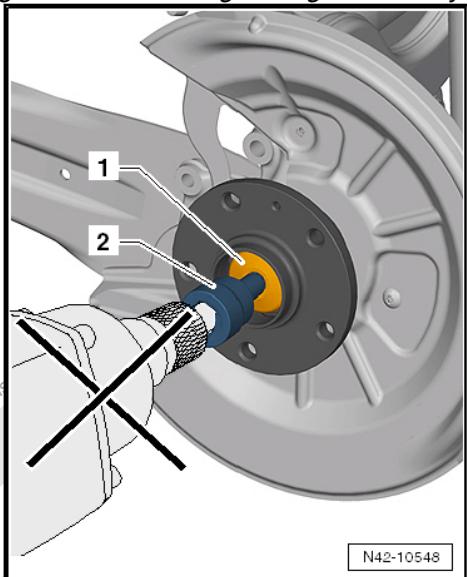
Make sure that the wheel hubs/wheel bearing unit does not tilt!

- Install the new bolt -1- and tighten it to the tightening specification.



Note

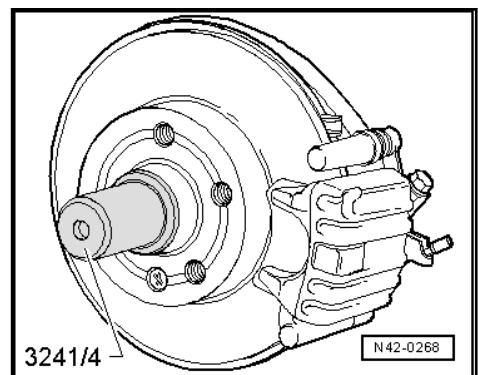
- ◆ First tighten the bolt to the specification using the torque wrench.
- ◆ Use a rigid wrench when tightening additionally.



Caution

Never use an impact wrench when tightening the bolt -1- using the Socket - XZN 18mm -T10162A- -2-.

- Drive dust cap on with Seal Installer - Camshaft Installer Kit - Sleeve -3241/4-.



Note

- ◆ Always replace dust caps.
- ◆ Damaged dust caps allow moisture to enter. Therefore, always use the tool shown.

Further installation is performed in reverse order.

- Install the wheel and tighten. Refer to [⇒ M2 ounting Tightening Specifications](#), page 315 .

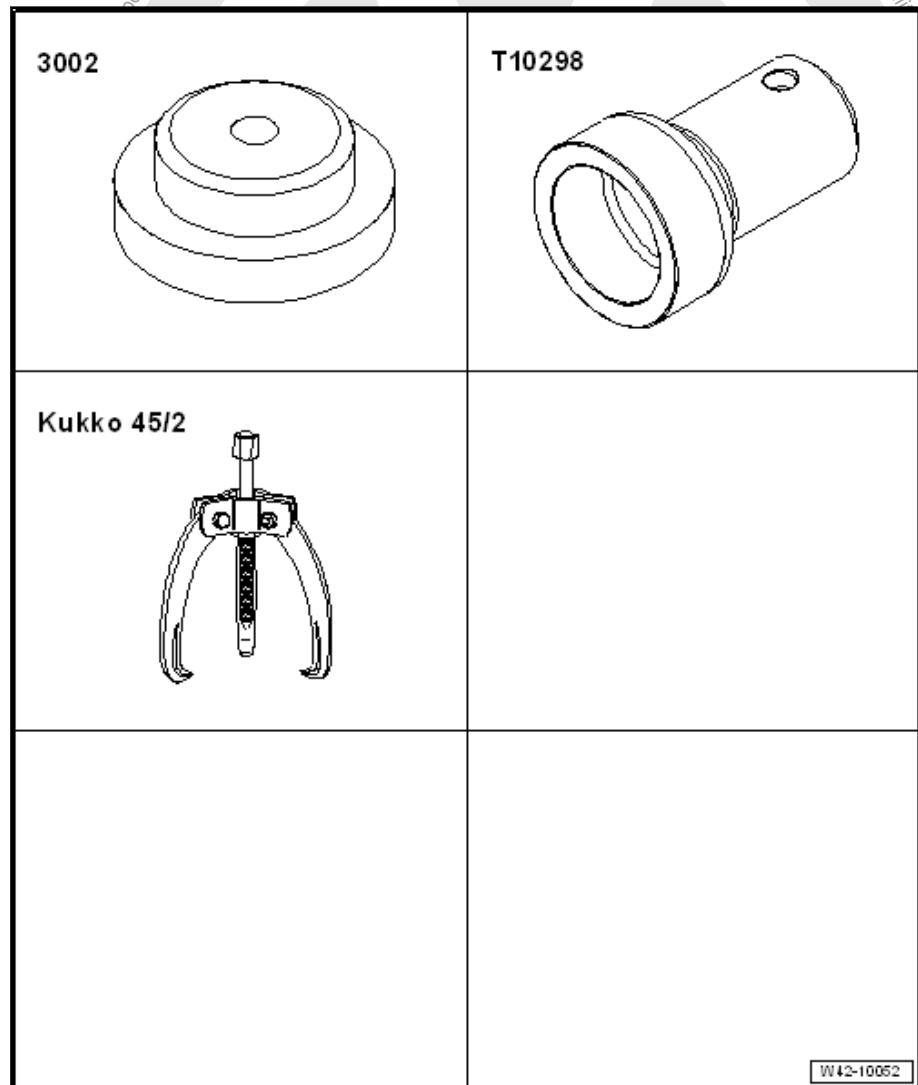


Tightening Specifications

Component	Tightening Specification
Wheel hub with wheel bearing to wheel bearing housing ◆ Use a new bolt	200 Nm +180°
Brake rotor to wheel bearing housing	8 Nm

4.4 Wheel Bearing Seal, Removing and Installing

Special tools and workshop equipment required

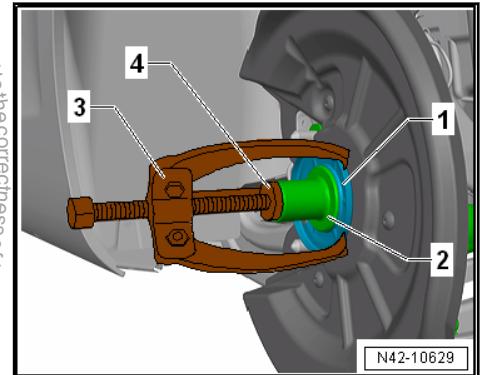


- ◆ Press Piece - Output Shaft Gear/Final Drive Gear -3002-
- ◆ Seal Installer - Bevel Box -T10298-
- ◆ Three-Arm Puller -Kukko 45/2-

Removing

- Loosen the wheel bolts.
- Raise the vehicle.
- Remove the wheel.

- Remove ABS wheel speed sensor from wheel bearing housing
- Remove the wheel bearing unit. Refer to [B4.3 earing and Wheel Hub, Removing and Installing](#), page 178 .
- Remove the wheel bearing seal -1- from the wheel bearing housing -2-.



3 - Three-Arm Puller -VAS 251205-

4 - Press Piece - Output Shaft Gear/Final Drive Gear -3002-

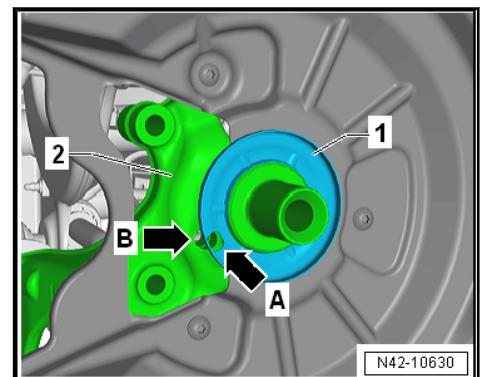


Note

Make sure no parts fall down when removing.

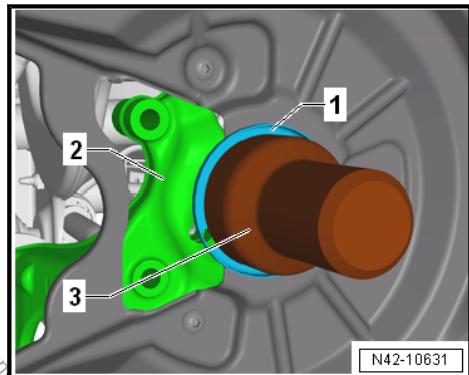
Installing

- Align the hole on the wheel bearing seal -1- with the hole on the speed sensor in the wheel bearing housing -2-.



The hole on the wheel bearing seal -arrow A- must align with the hole for the speed sensor -arrow B-.

- Drive the wheel bearing seal -1- on the wheel bearing housing -2-.



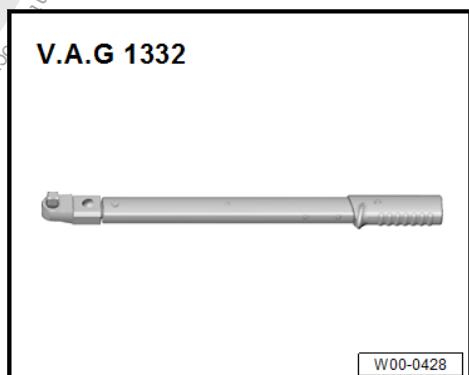
3 - Seal Installer - Bevel Box -T10298-

- Install the wheel bearing unit. Refer to [B4.3 earing and Wheel Hub, Removing and Installing](#), page 178 .
- Install the brake rotor and brake carrier with the brake caliper. Refer to [Brake System; Rep. Gr. 46](#).
- Install ABS speed sensor.
- Install the wheel and tighten. Refer to [M2 ounting Tightening Specifications](#), page 315 .

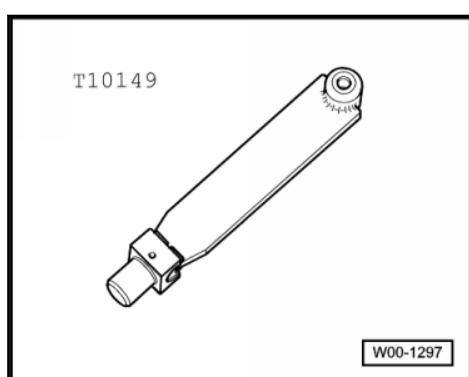
4.5 Trailing Arm with Mounting Bracket, Removing and Installing

Special tools and workshop equipment required

- ◆ Torque Wrench, 40-200Nm -V.A.G 1332A-



- ◆ Engine/Gearbox Jack Adapter - Wheel Hub Support - T10149-

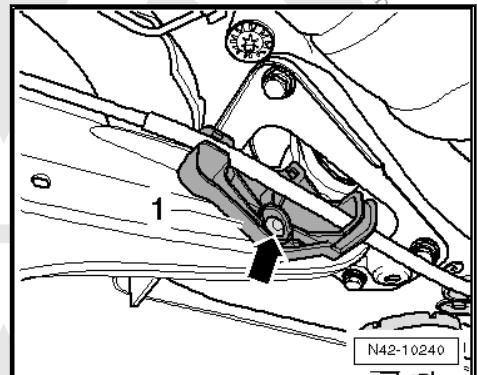


Removing

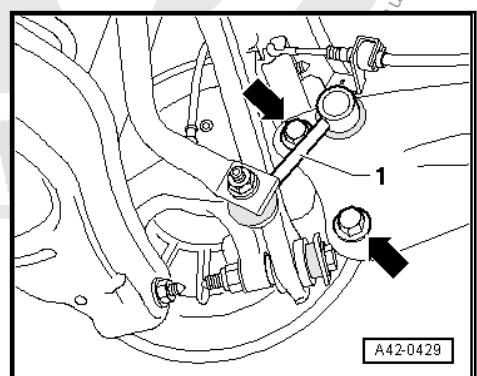
- Remove the wheel.
- Remove the coil spring. Refer to [S5.1 pring, Removing and Installing](#), page 192 .



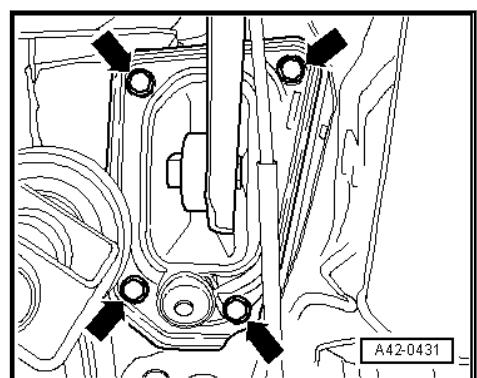
- Remove the bracket -1- by pressing out rivet inner pin -arrow-.



- Remove the coupling rod -1- from trailing arm.



- Remove the bolts -arrows-.
- Mark installation position of mounting bracket on body.
- Remove the bolts -arrows-.



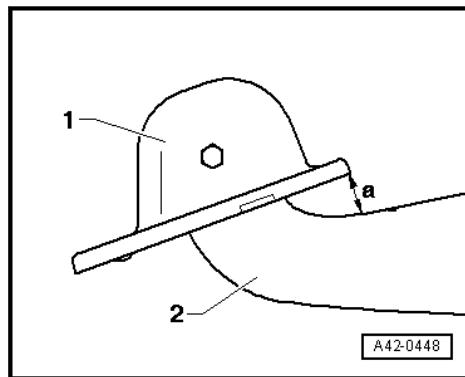
- Remove the trailing arm with mounting bracket.

If the trailing arm is being replaced, the mounting bracket must be removed from trailing arm.

Installation position of mounting bracket to trailing arm must then be adjusted. Refer to [>, page 185](#).

Determining the installation position of mounting bracket relative to the trailing arm

Dimension -a- is 34 ± 1 mm.



1 - Mounting Bracket

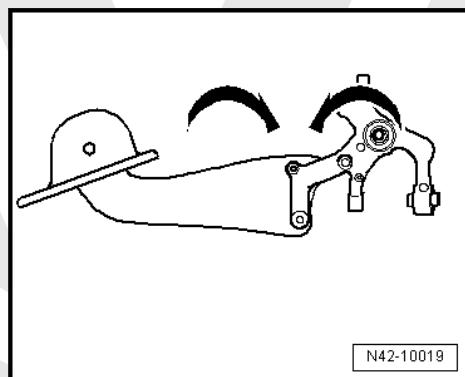
2 - Trailing Arm

- When dimension -a- has been adjusted, tighten bolt.

Installing

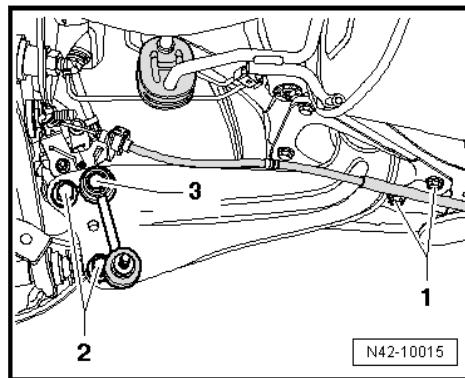
The trailing arm/wheel bearing housing threaded connection must only be tightened when all other components (especially the spring and strut) of the respective wheel suspension have already been assembled. To tighten, suspension must be unloaded. Only now do the trailing arm and wheel bearing housing move into the position required -arrows-.

Position: trailing arm/wheel bearing housing threaded connection



Always perform the following steps in the sequence given!

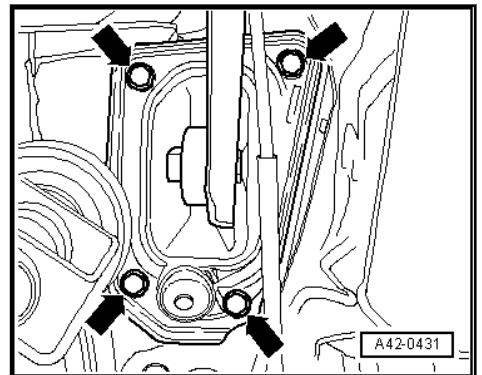
- Install the trailing arm and mounting bracket with bolts -2- on wheel bearing housing but do not yet tighten.



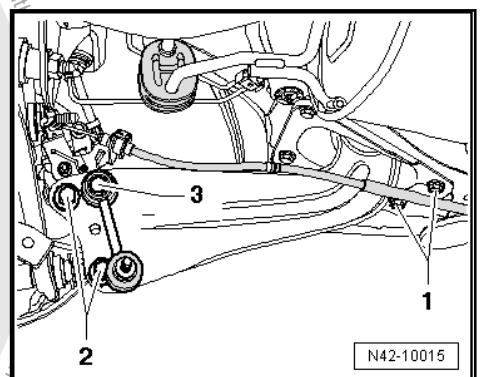
- Insert the coupling rod -3- into the trailing arm, do not tighten nut yet.



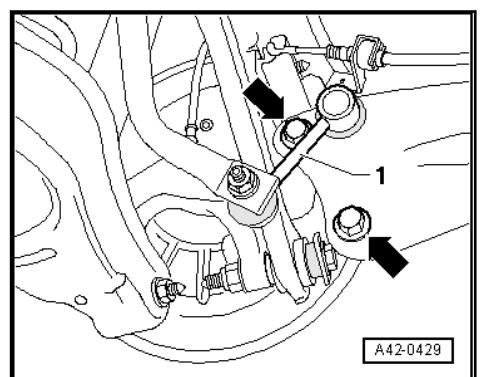
- Raise the suspension using Engine and Gearbox Jack -VAS 6931- and Engine/Gearbox Jack Adapter - Wheel Hub Support -T10149-, until the mounting bracket contacts the body.
- Tighten the bolts -arrows- on the old impression.



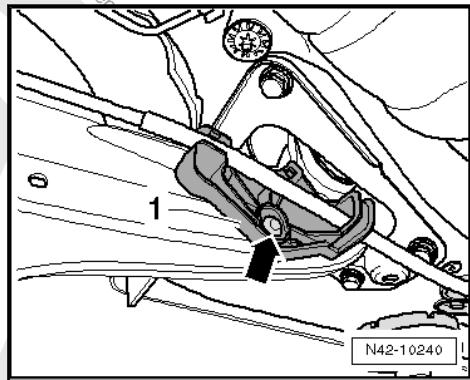
- Lower the suspension again using the Engine and Gearbox Jack -VAS 6931- and remove the Engine/Gearbox Jack Adapter - Wheel Hub Support -T10149- from the wheel hub.
- Install the coil spring. Refer to [S5.1 Spring, Removing and Installing](#), page 192 .
- Tighten the trailing arm bolts -2- to the tightening specification while making sure the components are in their necessary positions. Refer to [Fig. "Position: trailing arm/wheel bearing housing threaded connection"](#), page 186 .



- Connect the coupling rod -1- to the wheel bearing housing and stabilizer bar.



- Install bracket -1- by pressing in new rivet inner pin -arrow-.



- Install the wheel and tighten. Refer to [⇒ M2 Counting Tightening Specifications](#), page 315 .
- Perform vehicle alignment. Refer to [⇒ A8 Alignment](#), page 340 .

Tightening Specifications

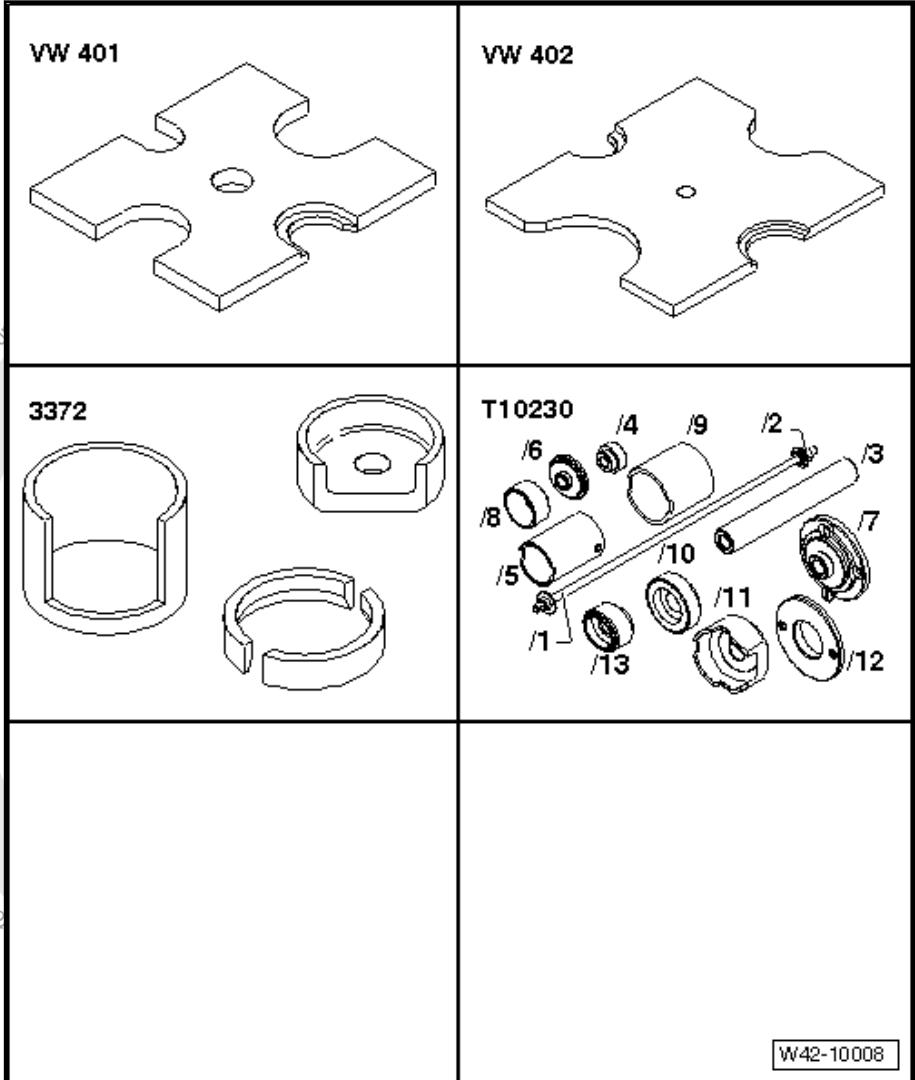
Component	Tightening Specification
Trailing arm to wheel bearing housing ◆ Use new bolts.	90 Nm + 45°
Trailing arm to mounting bracket ◆ Use a new bolt	90 Nm + 90°
Mounting bracket to body ◆ Use new bolts.	50 Nm + 45°
Coupling rod to trailing arm ◆ Use a new nut	45 Nm
Parking brake cable to trailing arm. Refer to ⇒ Brake Systems; Rep. Gr. 46.	

4.6 Trailing Arm, Servicing



Special tools and workshop equipment required

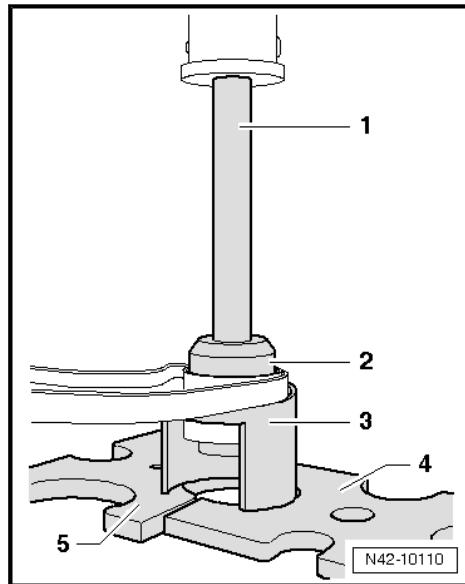
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- ◆ Press Plate -VW 401-
- ◆ Press Plate -VW 402-
- ◆ Hydraulic Press - Bushing Assembly Tool Kit -T10230-
- ◆ Front Subframe Mount Kit -3372-

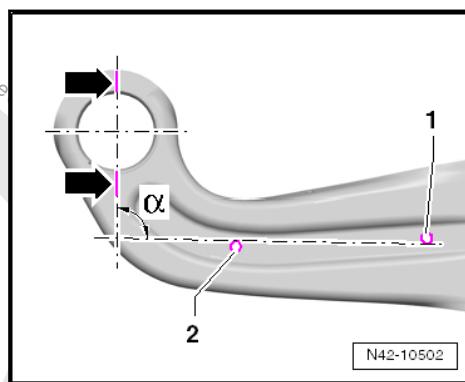
Bonded Rubber Bushing, Pressing Out

- Remove the trailing arm. Refer to [⇒ A4.5 rm with Mounting Bracket, Removing and Installing](#), page 184 .
- Install the tools as shown.



- 1 - Hydraulic Press - Bushing Assembly Tool Kit - Pipe - T10230/3-
- 2 - Hydraulic Press - Bushing Assembly Tool Kit - Press Piece -T10230/10-
- 3 - Front Subframe Mount Kit -3372-
- 4 - Press Plate -VW 401-
- 5 - Press Plate -VW 402-
- Press out the bonded rubber bushing.

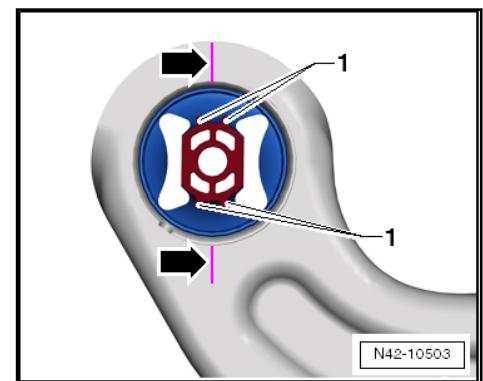
Bonded Rubber Bushing, Pressing In



- Mark the position of the bonded rubber bushing on the trailing arm with a right angle.
- Place the outer edge of the right angle on the lower -1- and upper radius -2- of the hole.
- Make a mark over and under the bushing on the trailing arm -arrows-.

α - 90°

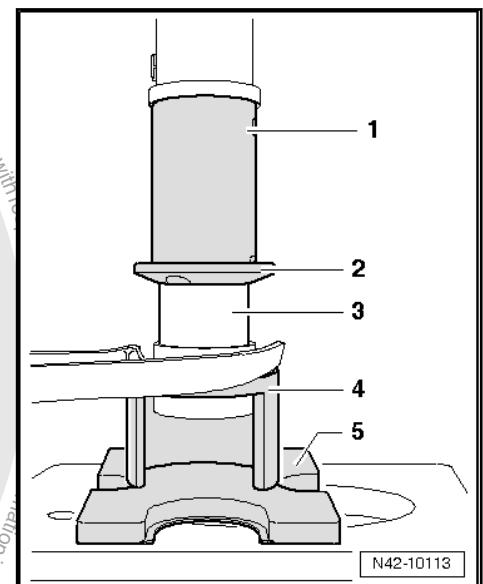
Position the bonded rubber bushing on the trailing arm so that the marked line -arrows- is between the raised sections -1-.



Note

Always make sure that the bonded rubber bushing is in the correct installation position to the trailing arm bushing.

- Install the special tools as shown.



- 1 - Hydraulic Press - Bushing Assembly Tool Kit - Tube - T10230/5-
- 2 - Hydraulic Press - Bushing Assembly Tool Kit-Thrust Plate -T10230/12-, the chamfer must face the bonded rubber bushing
- 3 - Bonded Rubber Bushing
- 4 - Front Subframe Mount Kit -3372-
- 5 - Press Plate -VW 402-
- Press in bonded rubber bushing flush.
- Install the mounting bracket on trailing arm. Refer to [page 185](#).
- Install the trailing arm. Refer to [page 186](#).



5 Overview - Shock Absorber and Coil Spring

- ⇒ [S5.1 Spring, Removing and Installing", page 192](#)
- ⇒ [A5.2 Absorber, Removing and Installing", page 194](#)
- ⇒ [A5.3 Absorber, Servicing", page 196](#)

1 - Upper Spring Support

2 - Coil Spring

- There are different versions of the suspension. Refer to ⇒ [D8.11 Data Label", page 353](#).
- Removing and Installing. Refer to ⇒ [S5.1 Spring, Removing and Installing", page 192](#).

3 - Lower Spring Support

- Spring end rotated up to stop

4 - Bolt

- 180 Nm

5 - Bolt

- 50 Nm + 45° additional turn
- Always replace if removed

6 - Shock Absorber

- Removing and Installing. Refer to ⇒ [A5.2 Absorber, Removing and Installing", page 194](#).
- There are different versions of the suspension. Refer to ⇒ [D8.11 Data Label", page 353](#) and to the vehicle data label.

7 - Lower Transverse Link

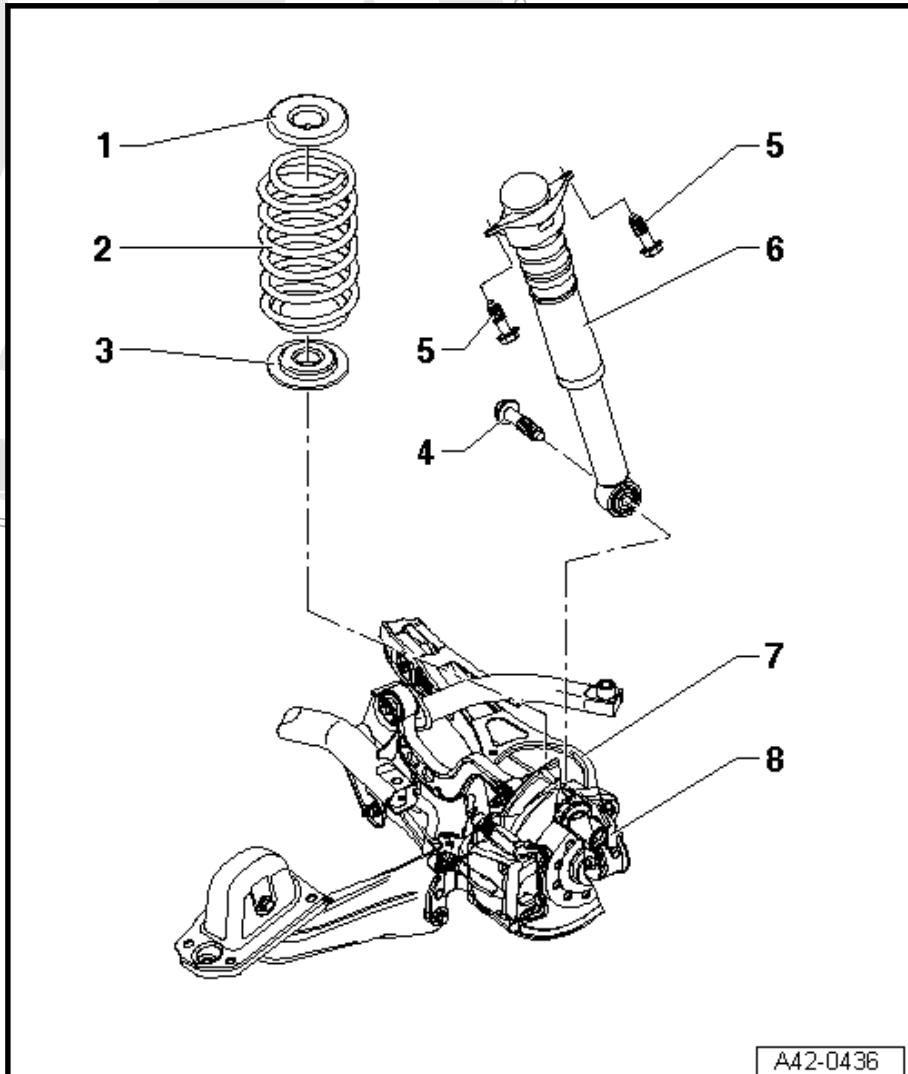
- Removing and Installing. Refer to ⇒ [T3.7 Transverse Link, Removing and Installing", page 163](#).

8 - Wheel Bearing Housing

- Removing and Installing. Refer to ⇒ [B4.1 Bearing Housing, Removing and Installing", page 170](#).

5.1 Coil Spring, Removing and Installing

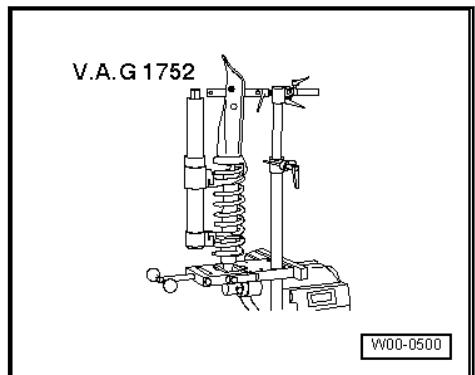
Special tools and workshop equipment required



A42-0436

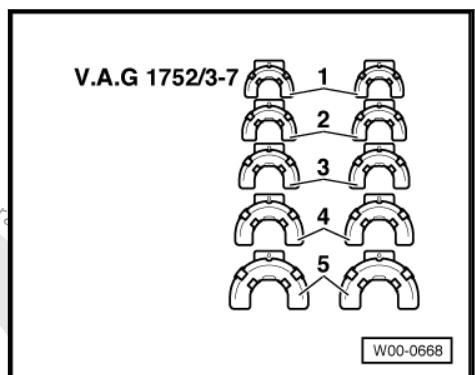


◆ Spring Compressor Kit -V.A.G 1752-



W00-0500

◆ Spring Compressor Kit - Spring Retainer with Inserts -V.A.G 1752/3A-

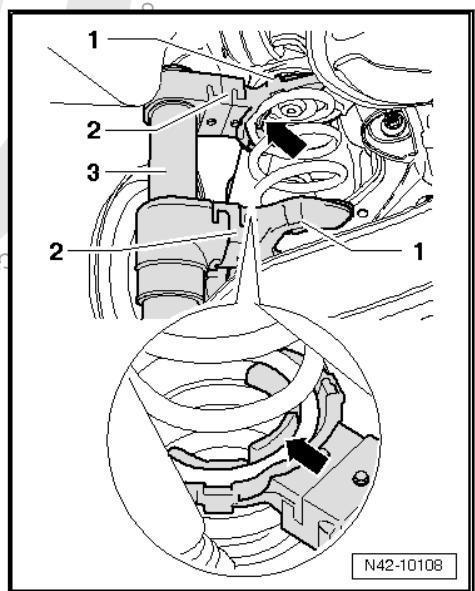


W00-0668

◆ Spring Compressor Kit - Adapter Blocks -V.A.G 1752/9-, not illustrated

Removing

- Remove the wheel.
- Insert spring compressor -3-.



N42-10108



WARNING

Make sure that coil spring is seated correctly in Spring Compressor Kit - Spring Retainer with Inserts -V.A.G 1752/3A- -2- (danger of accident).



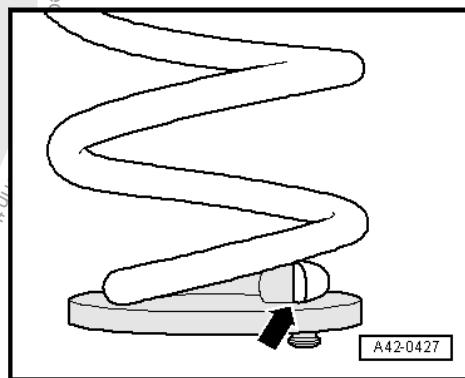
- Use a wrench or a reversible ratchet to tighten spring compressor.
- Tension the coil spring far enough until it can be removed.
- Remove the spring.

- 1 - Spring Compressor Kit - Spring Retainer with Inserts - V.A.G 1752/3A-
- 2 - Spring Compressor Kit - Adapter Blocks -V.A.G 1752/9-
- 3 - Spring Compressor Kit - Spring Tensioner -V.A.G 1752/1-

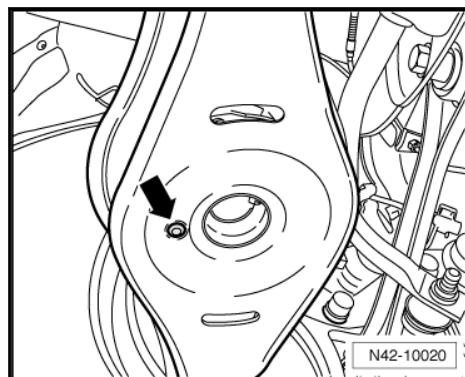
Installing

Observe installation position!

The spring start -arrow- must touch the stop of lower spring support.



- Insert the spring together with the spring support.
- The lower spring support has a pin.
- This pin is inserted into hole of lower transverse link -arrow-.



- Then insert spring seat at top into upper spring end.
- Relieve tension on spring, place upper spring seat onto tab of chassis when doing this.
- Remove spring tensioner.
- Install the wheel and tighten. Refer to [M2 Counting Tightening Specifications](#), page 315 .

5.2 Shock Absorber, Removing and Installing

Special tools and workshop equipment required



- ◆ Torque Wrench, 40-200Nm -V.A.G 1332A-

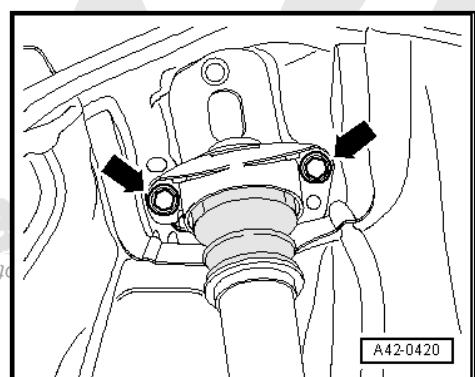
V.A.G 1332



W00-0428

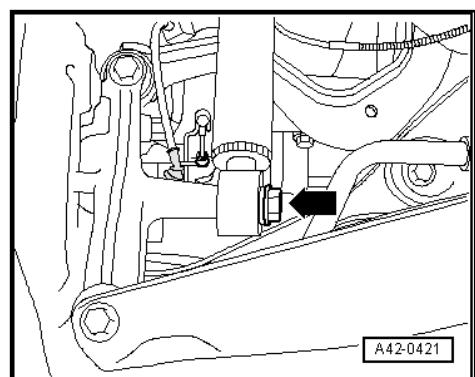
Removing

- Remove the wheel.
- Remove the wheel housing liner. Refer to ⇒ Body Exterior; Rep. Gr. 66; Wheel Housing Liner.
- Remove the coil spring. Refer to ⇒ [S5.1 pring, Removing and Installing](#), page 192 .
- Remove the bolts -arrows-.



A42-0420

- Remove the bolt -arrow-.



A42-0421

- Remove the shock absorber.

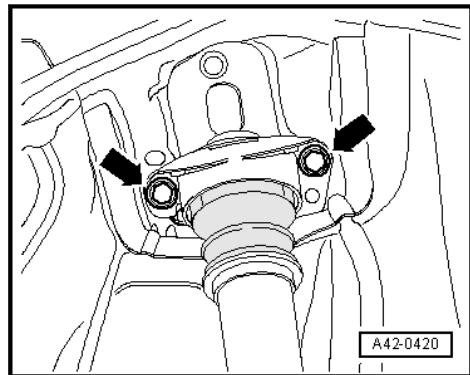
Installing

Install in reverse order of removal. Note the following:

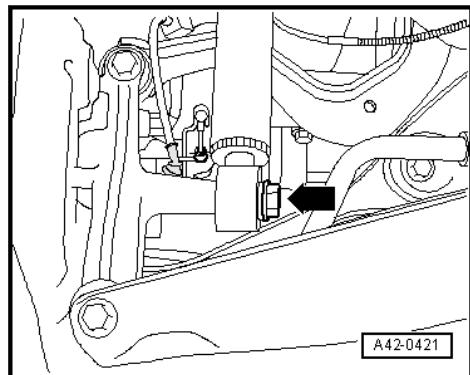
- Bring the rear axle to the curb weight position. Refer to ⇒ [A2.2 xle in Curb Weight Position](#), page 142 .

Only bolt on transverse link if dimension "a" is reached! Refer to ⇒ [Fig. ““Measure dimension -a- ””, page 209](#) .

- Insert shock absorber and tighten bolts -arrows-.



- Tighten the bolt -arrow-.



- Install the coil spring. Refer to ⇒ [S5.1 Spring, Removing and Installing](#), page 192 .
- Install the wheel housing liner. Refer to ⇒ Body Exterior; Rep. Gr. 66; Wheel Housing Liner.
- Install the wheel and tighten. Refer to ⇒ [Mounting Tightening Specifications](#), page 315 .

Tightening Specifications

Component	Tightening Specification
Shock absorber to body ◆ Use new bolts.	50 Nm + 45°
Shock absorber to wheel bearing housing	180 Nm

5.3 Shock Absorber, Servicing





1 - Shock Absorber

- Removing and Installing. Refer to [A5.2 bsorber, Removing and Installing](#), page 194 .
- There are different suspension versions. Refer to [D8.11 ata Label](#), page 353 for the vehicle data plate.

2 - Protective Cap

3 - Protective Pipe

4 - Support Ring

- Allocation. Refer to the [Electronic Parts Catalog \(ETKA\)](#).

5 - Stop Buffer

- For shock absorber with supporting ring , item 4 [Item 4 \(page 197\)](#)
- Allocation. Refer to the [Electronic Parts Catalog \(ETKA\)](#).

6 - Shock Absorber Mount

- For shock absorber with supporting ring , item 4 [Item 4 \(page 197\)](#)
- Allocation. Refer to the [Electronic Parts Catalog \(ETKA\)](#).

7 - Nut

- 25 Nm
- Always replace if removed
- Loosening and tightening. Refer to [Fig. "Shock Absorber Mount Threaded Connection, Loosening and Tightening"](#), page 198

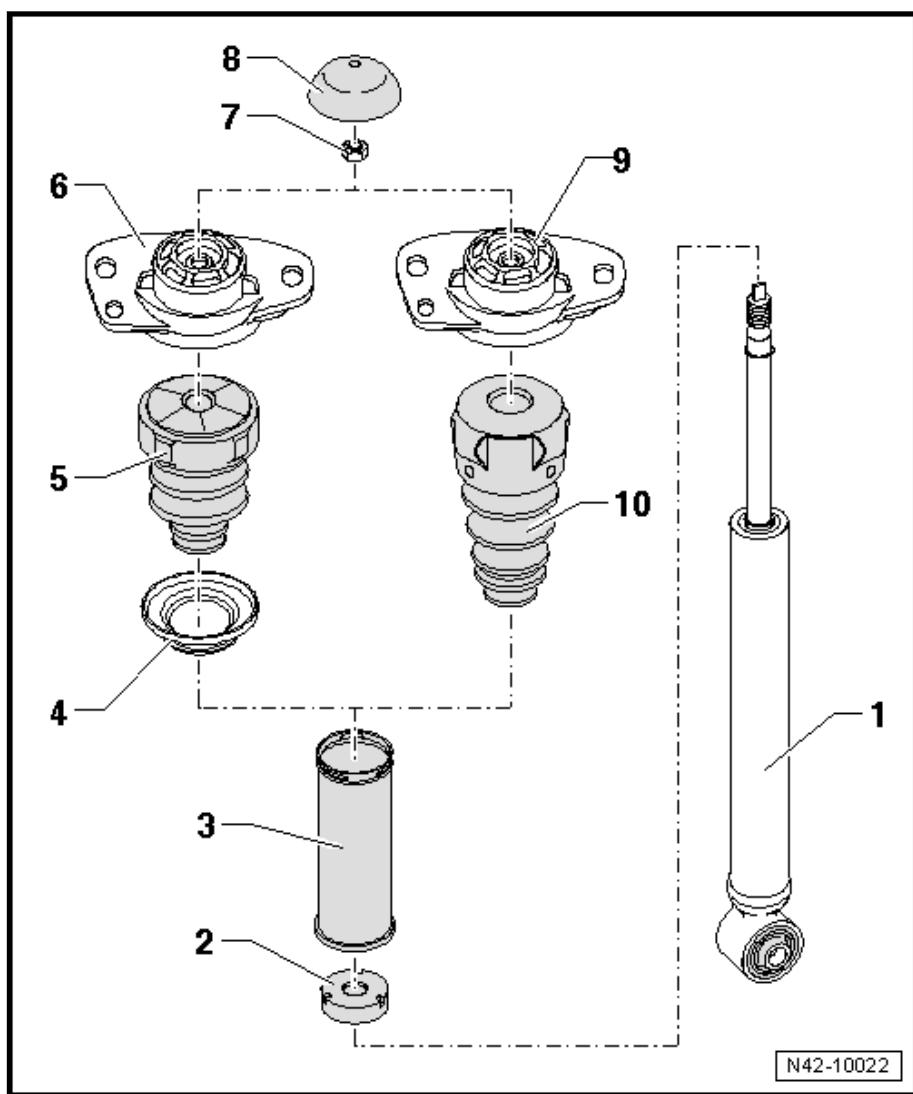
8 - Cover

9 - Shock Absorber Mount

- For shock absorber without supporting ring, item 4 [Item 4 \(page 197\)](#)
- Allocation. Refer to the [Electronic Parts Catalog \(ETKA\)](#).

10 - Stop Buffer

- For shock absorber without supporting ring, item 4 [Item 4 \(page 197\)](#)
- Allocation. Refer to the [Electronic Parts Catalog \(ETKA\)](#).



N42-10022

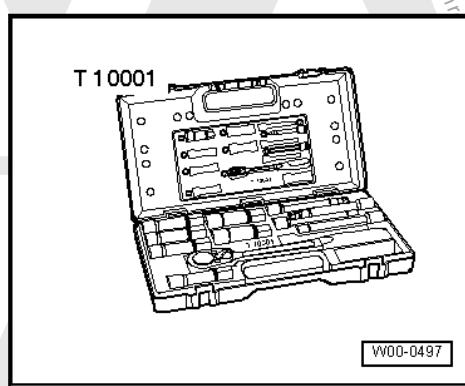
Special tools and workshop equipment required



- ◆ Torque Wrench, 40-200Nm -V.A.G 1332A-

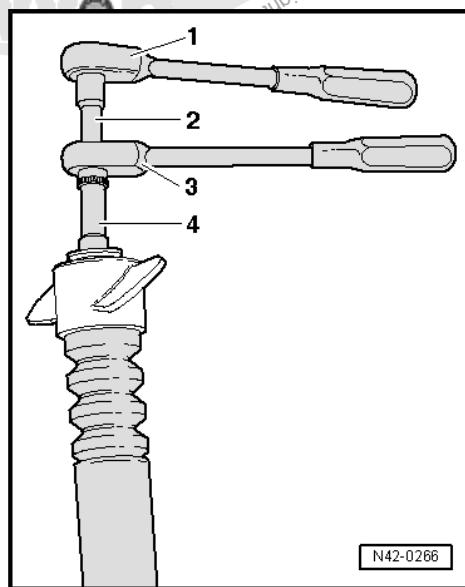


- ◆ Shock Absorber Set -T10001-



Disassembling and assembling

Shock Absorber Mount Threaded Connection, Loosening and Tightening



- 1 - Commercially Available Ratchet
- 2 - Shock Absorber Set - Extension with Counter Holder 1 -T10001/9-
- 3 - Shock Absorber Set - Reversible Ratchet -T10001/11-
- 4 - Shock Absorber Set - Socket -T10001/1-

**Tightening Specification**

Component	Tightening Specification
Shock absorber mount to shock absorber ◆ Use a new nut	25 Nm



6 Overview - Stabilizer Bar

⇒ [B6.1 ar, Removing and Installing", page 200](#)

The -arrow- points in the direction of travel.

1 - Stabilizer Bar

- There are different versions of the suspension. Refer to ⇒ [D8.11 ata Label", page 353](#).
- Removing and Installing. Refer to ⇒ [B6.1 ar, Removing and Installing", page 200](#).

2 - Bearings

- Replace bearings always on both sides of vehicle

3 - Clamp

4 - Bolt

- 25 Nm + 45° additional turn
- Tighten uniformly
- Always replace if removed
- Always tighten the threaded connections in curb weight position. Refer to ⇒ [A2.2 xle in Curb Weight Position", page 142](#).

5 - Wheel Bearing Housing

6 - Nut

- 45 Nm
- Self-locking
- Always replace if removed

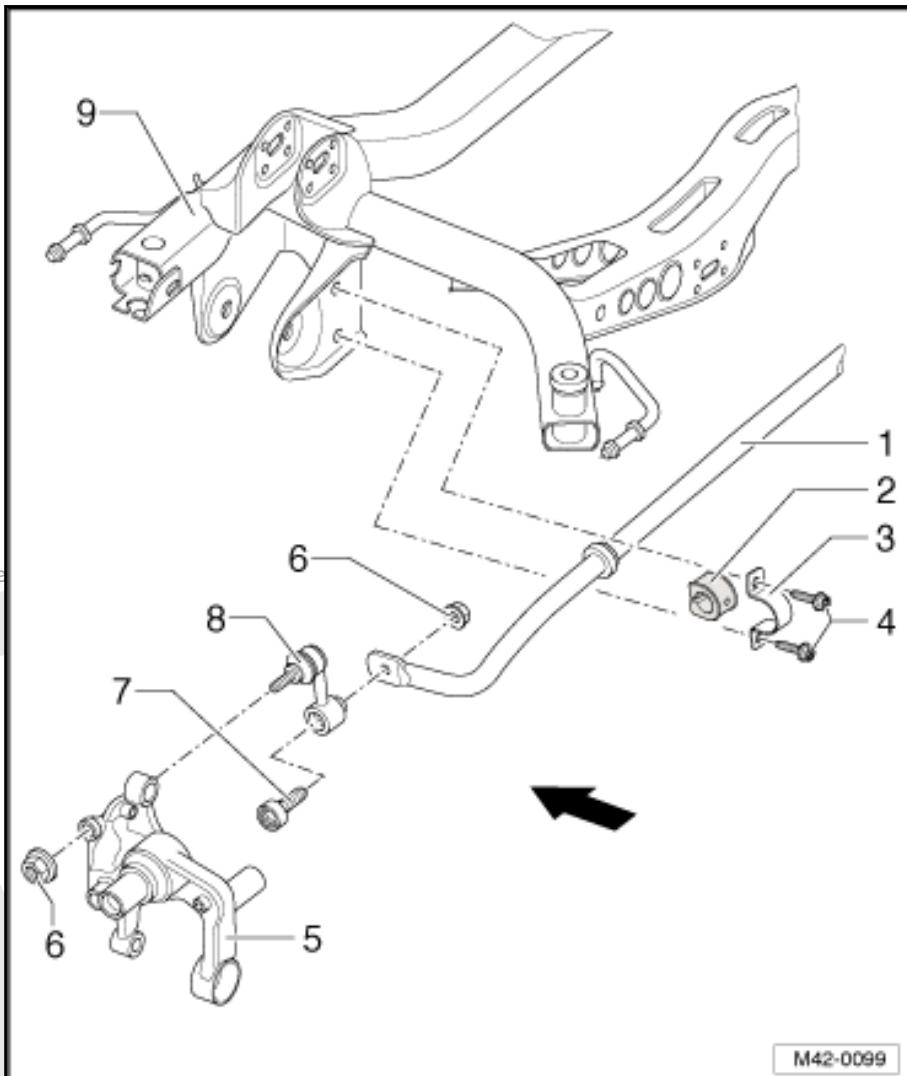
7 - Internal Multi-Point Bolt

- Self-locking
- Always replace if removed

8 - Coupling Rod

- Connects stabilizer bar to trailing arm/wheel bearing housing

9 - Subframe



6.1 Stabilizer Bar, Removing and Installing

Special tools and workshop equipment required



- ◆ Torque Wrench, 6-50Nm -VAG 1331A-

V.A.G 1331



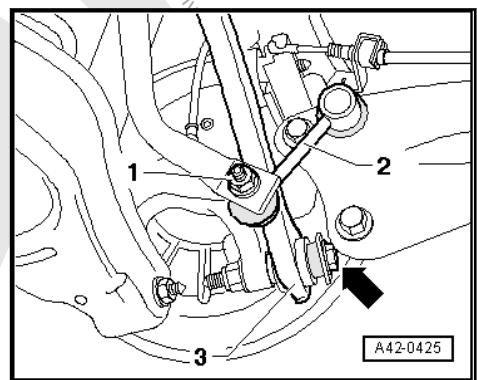
W00-0427

Removing



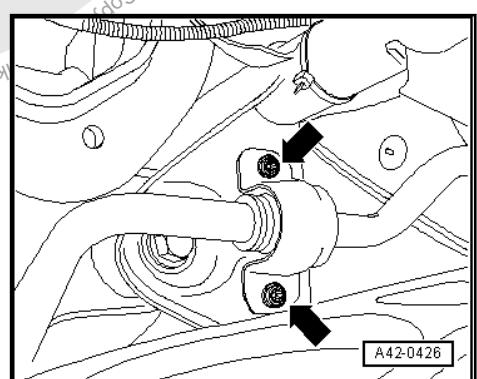
The following work steps are described for the left side of the vehicle. These work steps also apply At the same time for right side of vehicle.

- Remove the nut -1- and pull the coupling rod -2- out of the stabilizer bar.



Do not loosen bolt -arrow- for tie rod -3-.

- Remove the bolts -arrows- for the stabilizer bar clamp.

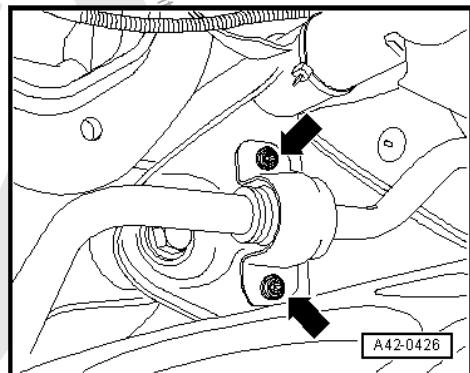


- Remove the stabilizer bar.

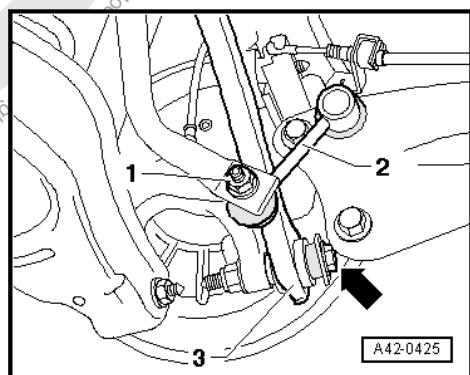


Installing

- Insert stabilizer into vehicle.
- Tighten the bolts -arrows- for stabilizer clamp uniformly.



- Insert coupling rod -2- into stabilizer and tighten nut -1-.



Tightening Specifications

Component	Tightening Specification
Stabilizer bar to subframe ◆ Use new bolts. ◆ Tighten bolts in curb weight position	25 Nm + 45°
Stabilizer bar to coupling rod ◆ Use a new nut	45 Nm



7 Overview - Subframe Attachments, BlueMotion Vehicles, FWD

⇒ A7.1 xle Trim Panel, Removing and Installing", page 203

1 - Subframe

2 - Bolt

3 - Angle Bracket

- with pop rivet screw

4 - Nut

- 20 Nm

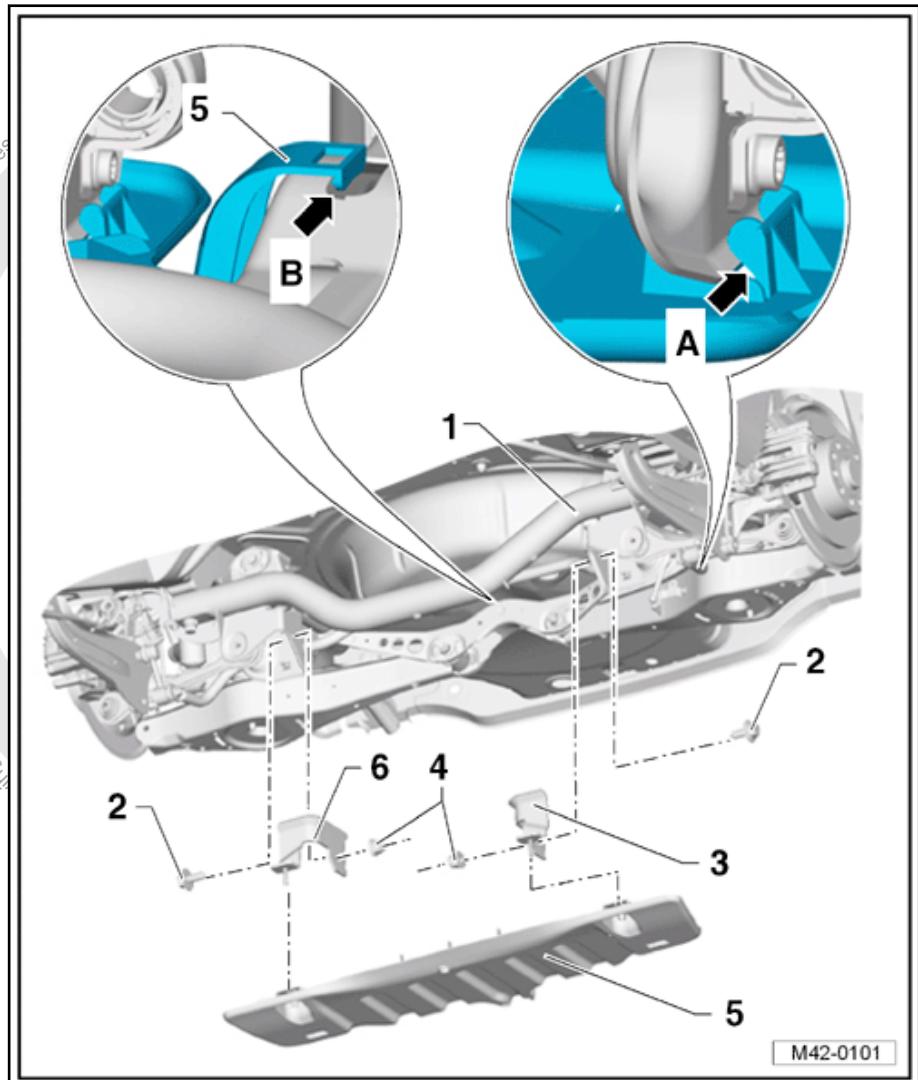
5 - Trim Panel

- Tighten the nuts to 2 Nm
- Removing and Installing. Refer to ⇒ A7.1 xle Trim Panel, Removing and Installing", page 203 .

- When installing, the trim panel must be attached from underneath to the subframe
⇒ Item 1 (page 203)
-arrow A- and attached from the top -arrow B-

6 - Angle Bracket

- with pop rivet screw

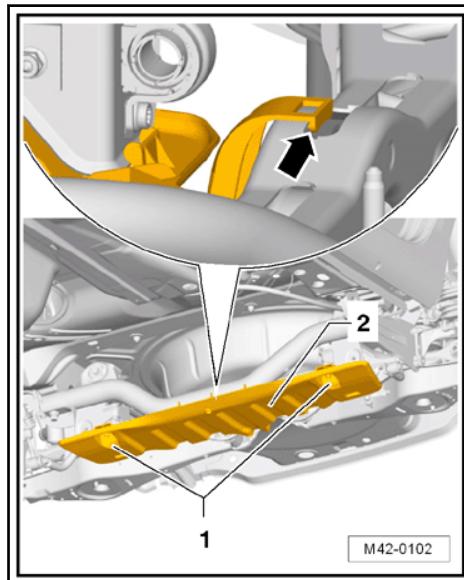


M42-0101

7.1 Rear Axle Trim Panel, Removing and Installing

Removing

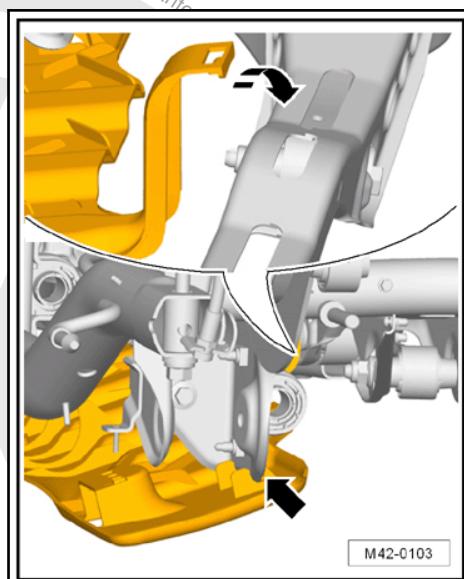
- Remove the nuts -1-.



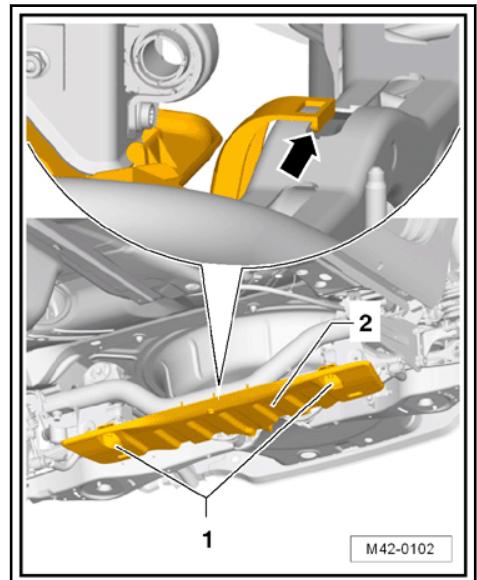
- Remove the trim panel -2- downward from the subframe while disengaging it on top -arrow-.

Installing

- Engage the lower trim panel in the subframe -arrow- and tilt it in -the direction of the arrow- so that it engages in the upper subframe.



- Tighten the nuts -1-.



M42-0102



Note

After installing the trim panel, make sure the tabs on the trim panel engage correctly in the subframe -arrow-.

Tightening Specifications

Component	Nm
Shield to subframe	2 Nm





8 Rear Suspension, Servicing, AWD

⇒ [-8.1 Rear Axle", page 206](#)

⇒ [A8.2 xle in Curb Weight Position", page 207](#)

8.1 Overview - Rear Axle

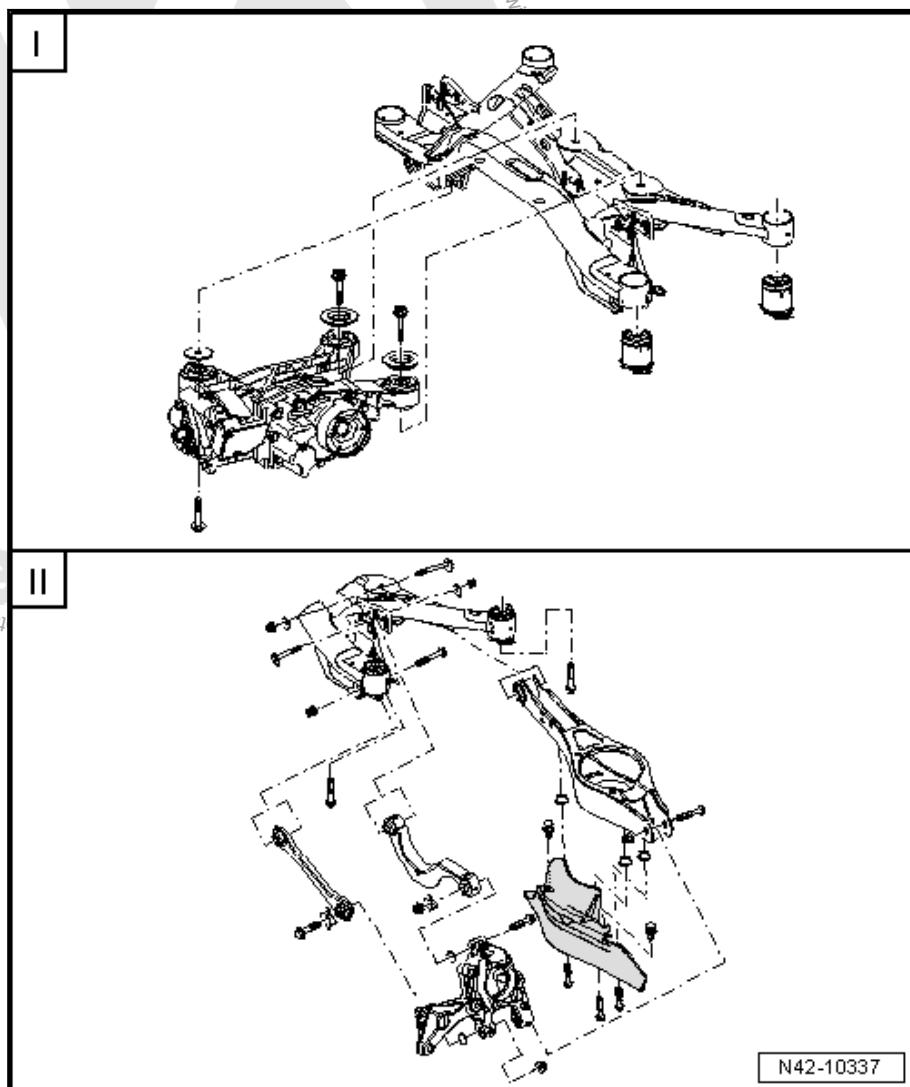


Note

- ◆ Welding and alignment work on suspension components that are supporting or control the wheels is not permitted.
- ◆ Always replace self-locking nuts.
- ◆ Always replace corroded bolts/nuts.
- ◆ Bonded rubber bushings have a limited range of rotation. Therefore, only tighten bolts on components with bonded rubber bushings when wheel bearing housing is lifted (curb weight position). Refer to [A8.2 xle in Curb Weight Position", page 207](#).
- ◆ Always replace bonded rubber bushings on both sides of vehicle.

I - ⇒ [-9 Subframe, Final Drive, AWD", page 211](#) .

II - ⇒ [-10 Transverse Link, Tie Rod, AWD", page 248](#) .

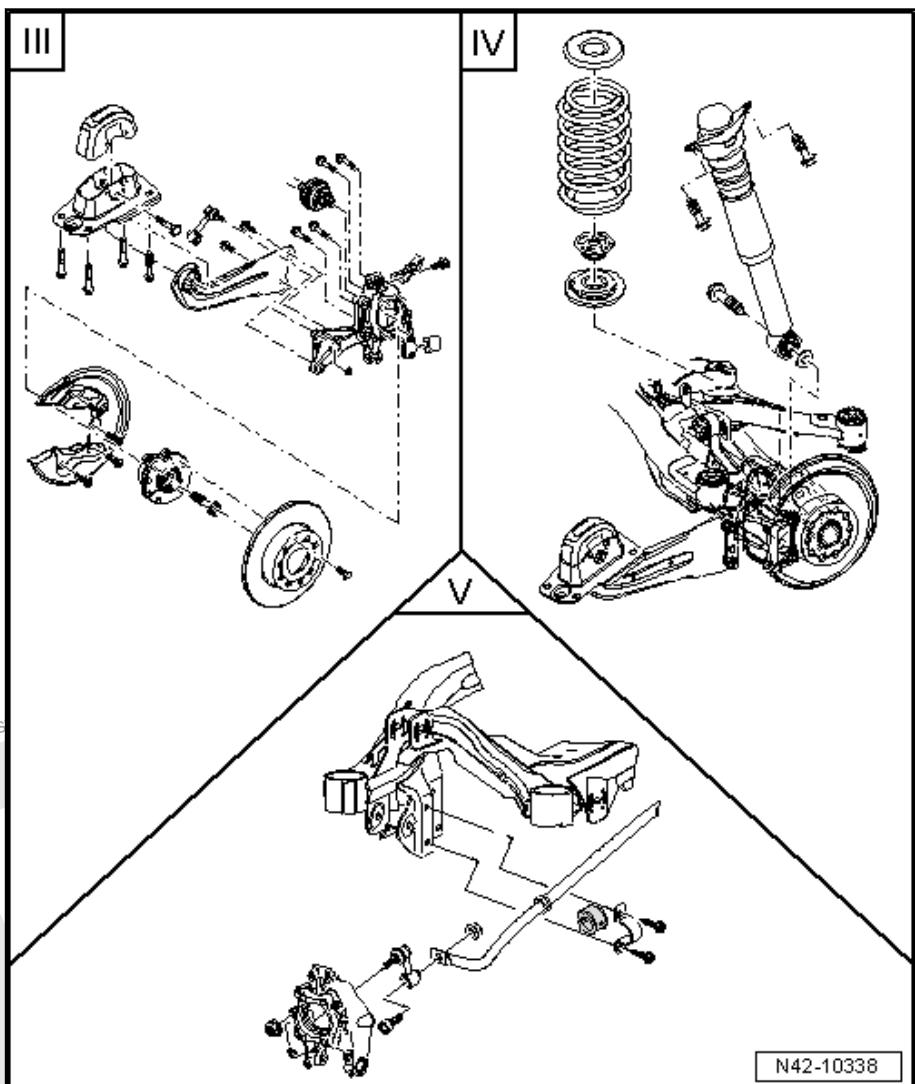




III - ➔ -11 Wheel Bearing Housing, Trailing Arm, AWD", page 262 .

IV - ➔ -12 Shock Absorber, Coil Spring, AWD", page 282 .

V - ➔ -13 Stabilizer Bar, AWD", page 290 .

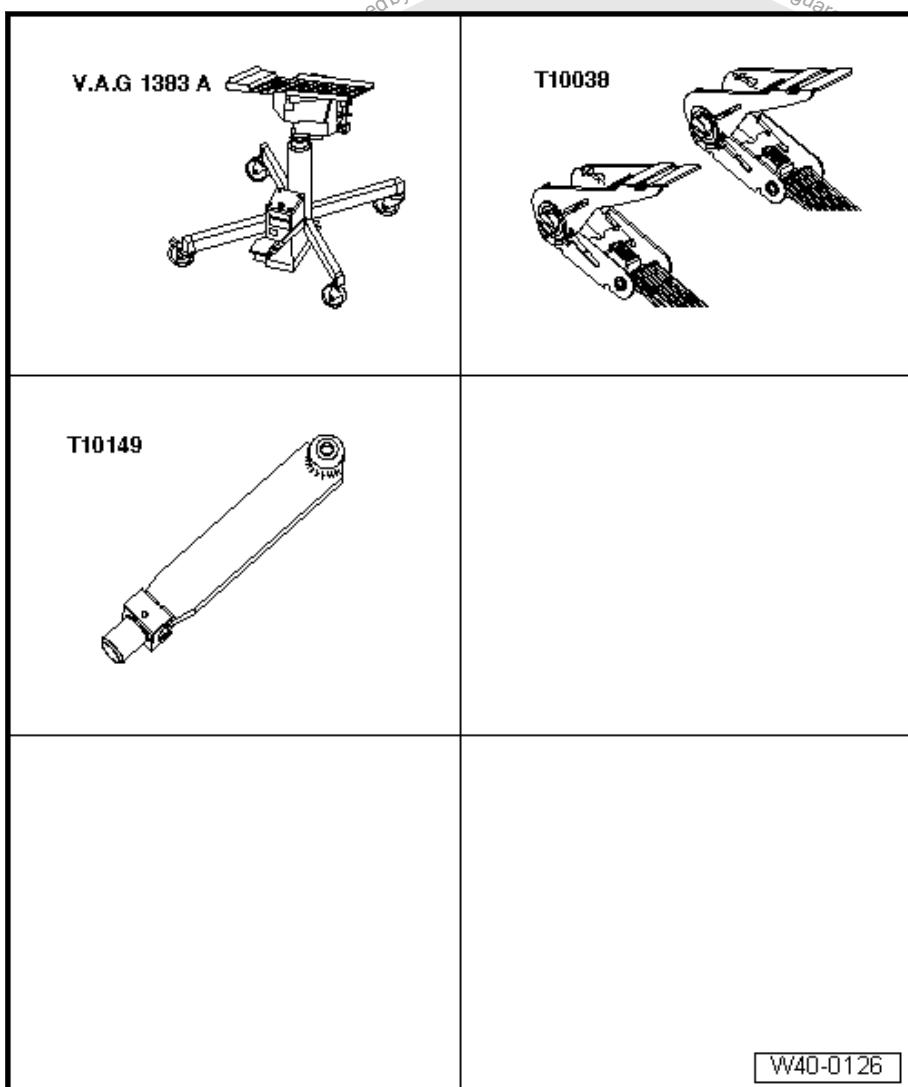


8.2 Rear Axle in Curb Weight Position

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Special tools and workshop equipment required



VW40-0126

- ◆ Engine and Gearbox Jack -VAS 6931-
- ◆ Tensioning Strap -T10038-
- ◆ Engine/Gearbox Jack Adapter - Wheel Hub Support - T10149-



Note

All bolts at suspension parts with bonded rubber bushings must always be tightened in curb weight position (unloaded condition).

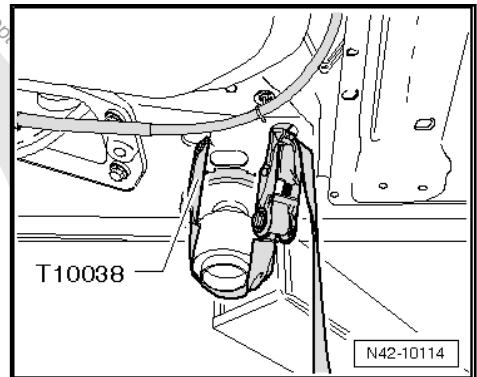
Bonded rubber bushings have a limited range of rotation.

Axle components with bonded rubber bushings must be brought into the position they will be in when driving before they are tightened (curb weight position).

Otherwise, the bonded rubber bushing will have tension, which will reduce the service life.

By raising axle on one side using Engine and Gearbox Jack -VAS 6931- and Engine/Gearbox Jack Adapter - Wheel Hub Support -T10149-, this position can be simulated on the hoist.

Before lifting the axle on one side, the vehicle must be secured on both sides to the hoist lifting arms using the Tensioning Strap -T10038.

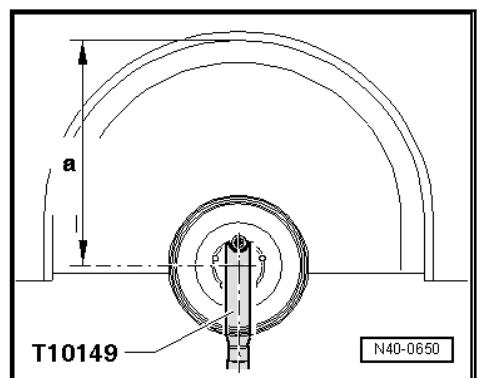

WARNING

There is a risk that the vehicle could fall off the hoist if it is not secured.

- Turn the wheel hub far enough until one of the holes for the wheel bolts is at the top.
- Install the Engine/Gearbox Jack Adapter -Wheel Hub Support- T10149- with the wheel bolt.

Only fasten after the dimension -a- measured before installation between the wheel hub center and lower edge of wheel housing is obtained.

Measure dimension -a-



The dimension -a- is dependent on the height of the installed suspension:

Chassis ¹⁾	Height -a- in mm
Basic suspension (2UA)	380 ± 10 mm
Heavy duty suspension (2UB)	400 ± 10 mm
Sport suspension except 18" wheels (2UC)	365 ± 10 mm
Sport suspension with 18" wheels (G02/G05/G07/2UC)	365 ± 10 mm

¹⁾ The type of vehicle suspension is indicated on the vehicle data label. The suspension is indicated by a PR number. To determine which PR number represents which suspension, Refer to [D8.11 ata Label](#), page 353 .



- Using the engine/transmission jack, lift the wheel bearing housing until dimension -a- has been reached.



WARNING

- ◆ ***Do not lift or lower vehicle with the engine and gearbox jack still under the vehicle.***
- ◆ ***Do not leave the engine/transmission jack under the vehicle any longer than necessary.***

- Tighten the applicable bolts and nuts.
- Lower the wheel bearing housing.
- Move engine and gearbox jack away from under vehicle.
- Remove the Engine/Gearbox Jack Adapter - Wheel Hub Support -T10149-





9 Overview - Subframe, Final Drive, AWD

⇒ [A9.1 xle, Removing and Installing", page 211](#)

⇒ [S9.2 servicing, through 7/1/2012", page 218](#)

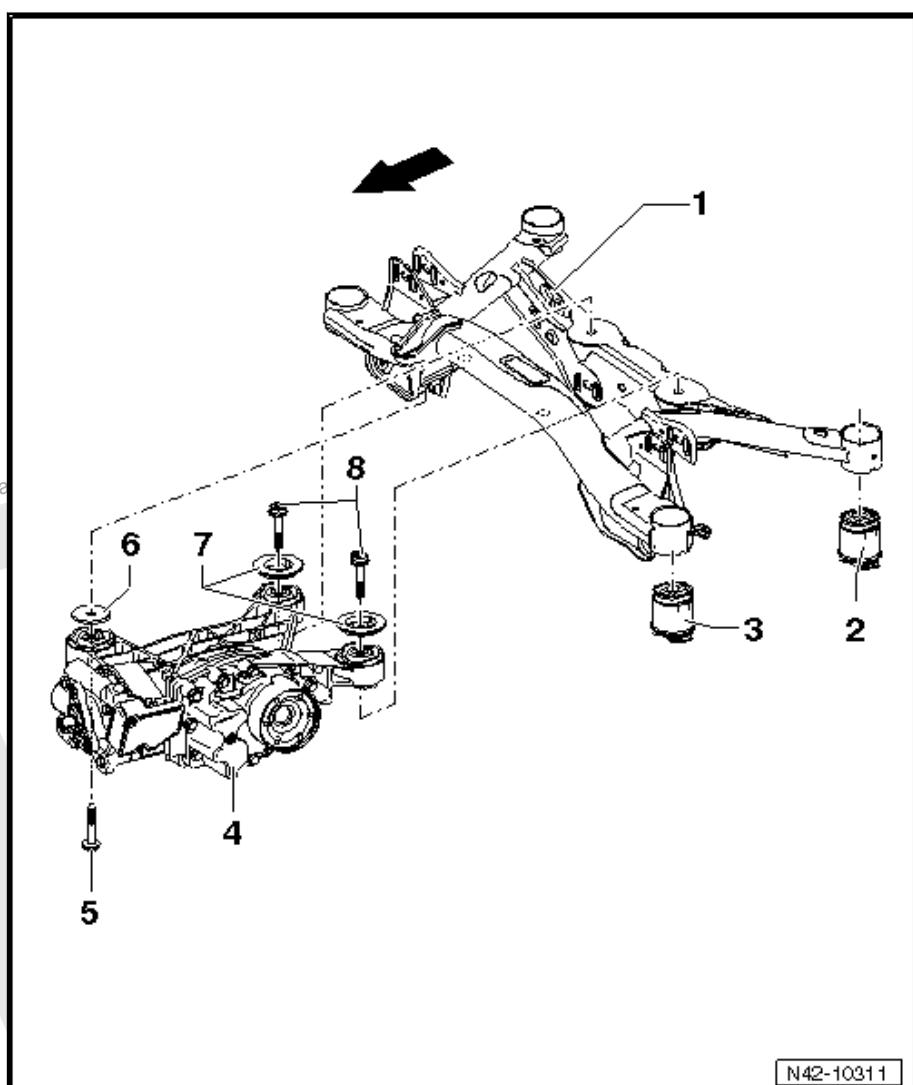
⇒ [S9.3 servicing, from 7/2/2012", page 230](#)

The -arrow- points in the direction of travel.

1 - Subframe

2 - Rear Bonded Rubber Bushing

- Replacing, through 7/1/2012. Refer to ⇒ [S9.2 servicing, through 7/1/2012", page 218](#).
- Replacing, from 7/2/2012. Refer to ⇒ [S9.3 servicing, from 7/2/2012", page 230](#).



N42-10311

4 - Final Drive

- Removing and Installing. Refer to ⇒ Rep. Gr. 39; Rear Final Drive, Removing and Installing.

5 - Bolt

- 60 Nm + 90° additional turn
- Always replace if removed

6 - Washer

- installed between final drive and subframe

7 - Washer

- washer must be placed with holes on tabs of bonded rubber bushing

8 - Bolt

- 60 Nm + 90° additional turn
- Always replace if removed

9.1 Rear Axle, Removing and Installing

Special tools and workshop equipment required



- ◆ Torque Wrench, 40-200Nm -V.A.G 1332A-



- ◆ Engine and Gearbox Jack -VAS 6931-



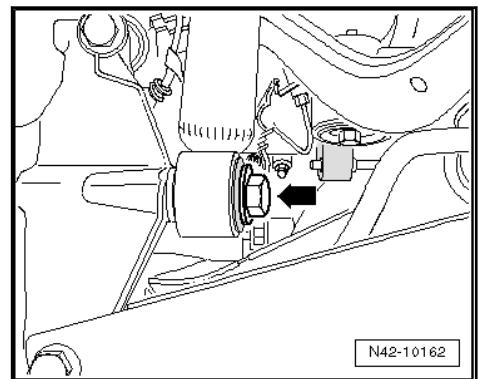
Removing the subframe and its attachments



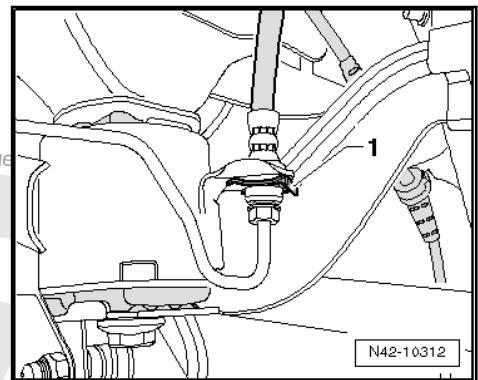
Note

Please note that the vehicle must be resting on all four wheels for assembly work later where the multi-point bolt for the drive axle must be loosened. Twelve-Point Bolt With Ribs, Loosening. Refer to [B14.1 bolt with Ribs, Loosening and Tightening, Drive Axle Threaded Connection](#), page 297. Twelve-Point Bolt Without Ribs, Loosening. Refer to [B14.2 bolt without Ribs, Loosening and Tightening, Drive Axle Threaded Connection](#), page 299.

- Remove the wheels.
- Remove the coil springs. Refer to [S12.1 spring, Removing and Installing](#), page 282.
- Remove the exhaust system rear muffler. Refer to [Rep. Gr. 26; Exhaust System; Exhaust System, Removing and Installing](#).
- Disconnect the electric connections between the rear axle and the body.
- Remove the bolt -arrow-.



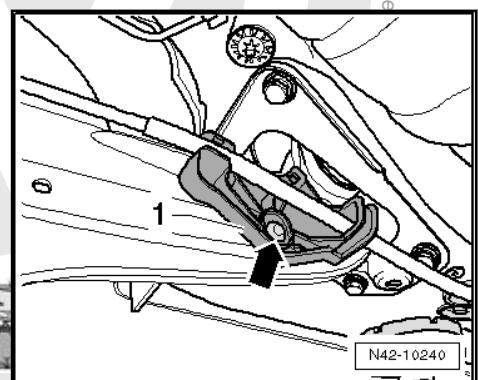
- Remove the clip -1-.



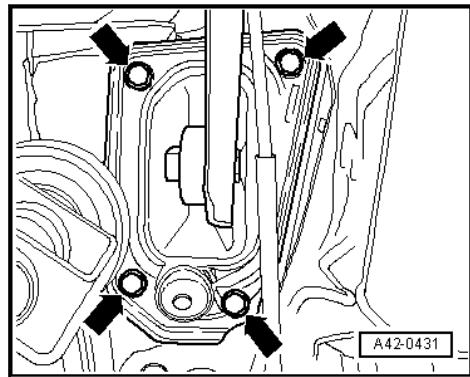
Note

Do not disconnect the brake line.

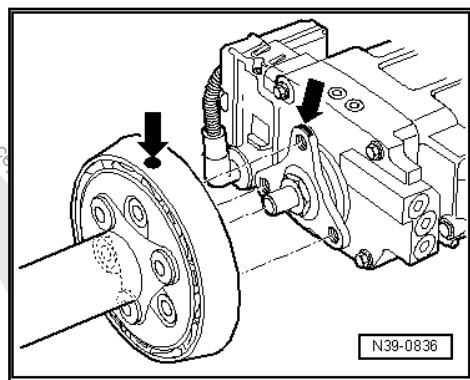
- Remove the bracket -1- by pressing out rivet inner pin -arrow-.



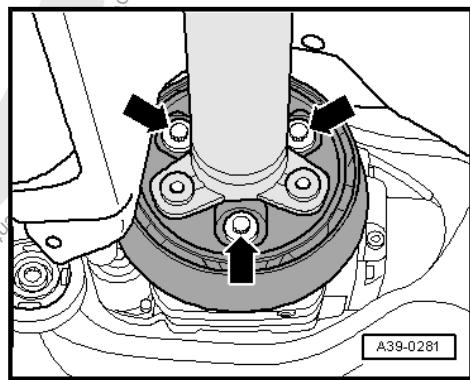
- Mark installation position of mounting bracket on body.



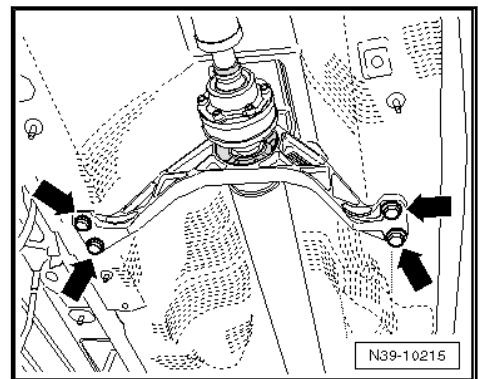
- Remove the bolts -arrows-.
- Disconnect Left Rear Level Control System Sensor -G76- connector.
- Check whether there is a marking (colored point) -arrows- on joint washer or final drive flange. If there is no mark, mark the position of the flexible disc and final drive flange to each other -arrows-.



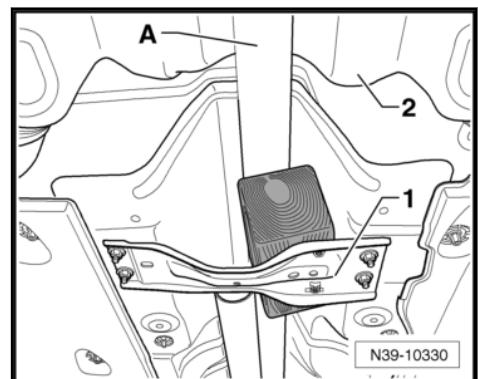
- Disconnect Right Rear ABS Wheel Speed Sensor -G44- and Left Rear ABS Wheel Speed Sensor -G46- connectors.
- Remove rear driveshaft tube from the rear final drive with the flexible disc and vibration damper -arrows-.



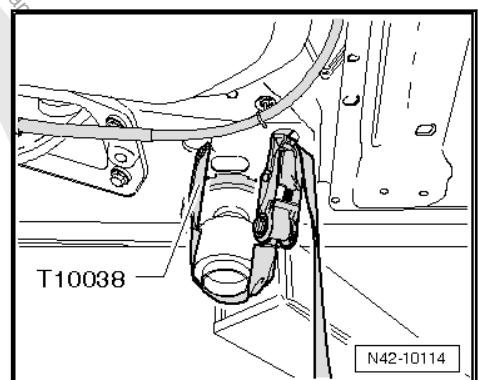
- Remove the center bracket screws -arrows- two turns.



- Support the driveshaft -A- on the tunnel support -1- with a wood block.



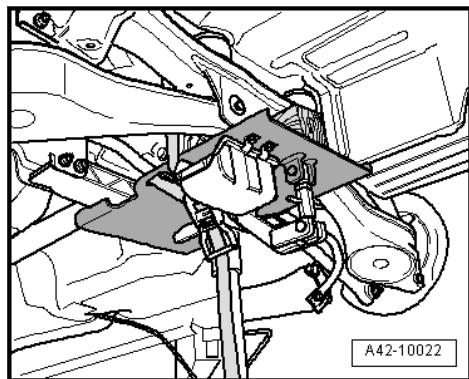
- Move rear driveshaft tube as far as possible in direction of transmission.
- Disconnect the connector to BorgWarner clutch above the final drive.
- Now secure the vehicle on both sides to the hoist lifting arms with Tensioning Strap -T10038-.



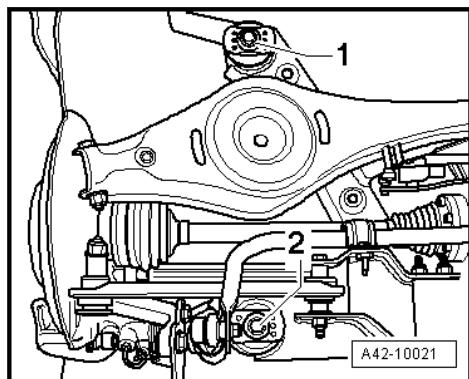
WARNING

If vehicle is not secured, it could slide off of hoist.

- Place the Engine and Gearbox Jack -VAS 6931- with the Universal Support Plate -V.A.G 1359/2- under the subframe and secure it with strap.



To secure the subframe, Locating Pins -T10096- must be screwed in one after the other on both sides of the vehicle at positions -1- and -2-.

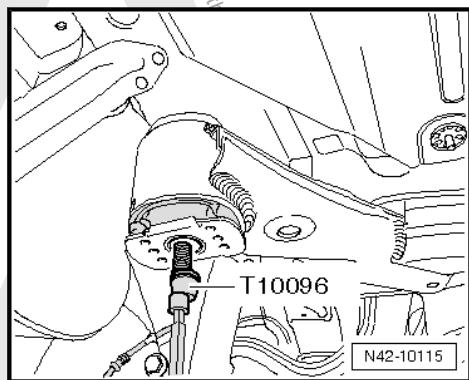


- Remove the hex bolt -1- or -2- on both sides.

Note

For clarity only the left side of the vehicle is shown.

- Secure the position of the subframes using two Locating Pins -T10096- to 20 Nm.



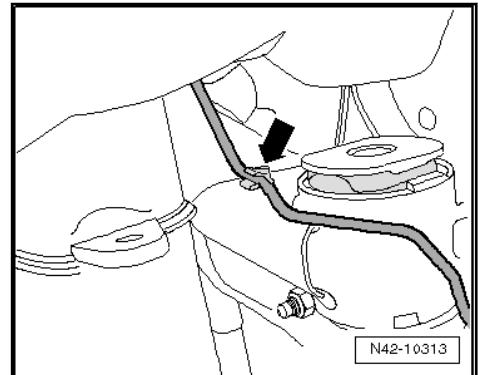
Note

Locating Pins -T10096- may only be tightened to a maximum of 20 Nm, otherwise the threads on the locating pins will be damaged.

- Replace the bolts of the subframe one after the other on both sides using Locating Pins -T10096- and tighten them to 20 Nm.

The subframe position is now secured.

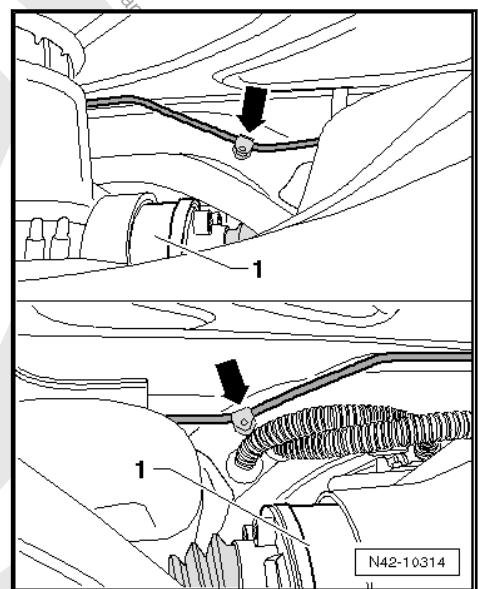
- Carefully lower the subframe with its attachments approximately 2 cm.
- Unclip the brake line on both sides -arrow-.



Note

When doing this, the clips will be destroyed and must be replaced.

- Remove the brake line above the drive axle flange on the transmission-1- from the clips -arrows-.



Note

When doing this, the clips will be destroyed and must be replaced.

- Carefully lower subframe with components.



Note

Make sure there is enough clearance for brake lines, wires and the driveshaft centering pin when lowering.

Subframe with Attachments, Installing

Install in reverse order of removal. Observe the following when doing so:

Note

- ◆ *Make sure the washer between the wheel bearing housing and shock absorber is also installed.*
- ◆ *Replace the destroyed brake line clips on the subframe.*

Connect the driveshaft to the rear final drive. Refer to ⇒ Rear Final Drive 02D/0AV; Rep. Gr. 39; Driveshaft, Removing and Installing.

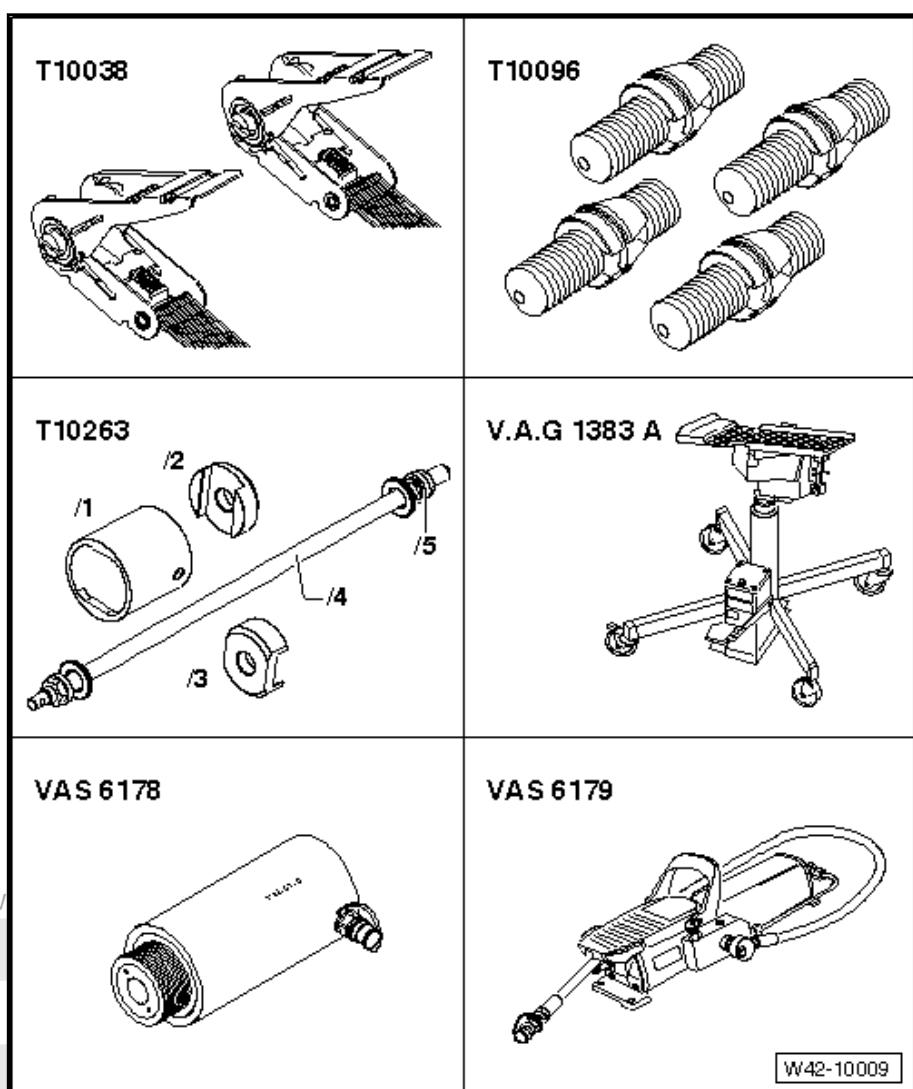
Tightening Specifications

Component	Tightening Specification
Subframe to body ◆ Use new bolts.	90 Nm +90° additional turn
Shock absorber to wheel bearing housing	180 Nm
Mounting bracket to body ◆ Use new bolts.	50 Nm + 45° additional turn

9.2 Subframe, Servicing, through 7/1/2012



Special tools and workshop equipment required



W42-10009

- ◆ Tensioning Strap -T10038-
- ◆ Locating Pins -T10096-
- ◆ Hydraulic Press - Rear Subframe Bushing Tool Kit -T10263-
- ◆ Engine and Gearbox Jack -VAS 6931-
- ◆ Hydraulic Press -VAS 6178- with Bearing Installer - Wheel Hub/Bearing Kit- Adapter 13 -T10205/13-
- ◆ Pneumatic/Hydraulic Foot Pump -VAS 6179-

Front bonded rubber bushing, removing [⇒ page 219](#)

Pull in front bonded rubber bushing [⇒ page 223](#)

Pulling out rear bonded rubber bushing [⇒ page 225](#)

Pulling in rear bonded rubber mounting [⇒ page 228](#)

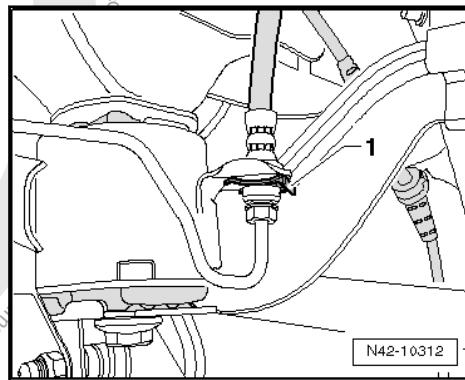
Front bonded rubber bushing, removing

- Remove the rear wheels.
- Remove the coil springs. Refer to [⇒ S12.1 spring, Removing and Installing", page 282](#).

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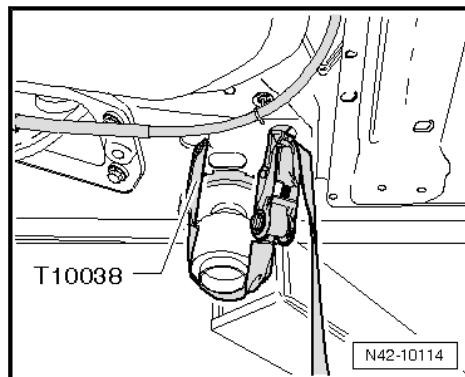
- Remove the exhaust system rear muffler. Refer to ⇒ Rep. Gr. 26; Exhaust System; Exhaust System, Removing and Installing.
- Disconnect the electric connections between the rear axle and the body.
- Remove the stabilizer bar. Refer to ⇒ [B13.1 ar, Removing and Installing](#), page 290 .
- Remove the tie rods. Refer to ⇒ [R10.5 od, Removing and Installing](#), page 258 .
- Remove the clip -1-.



Note

Do not disconnect the brake line.

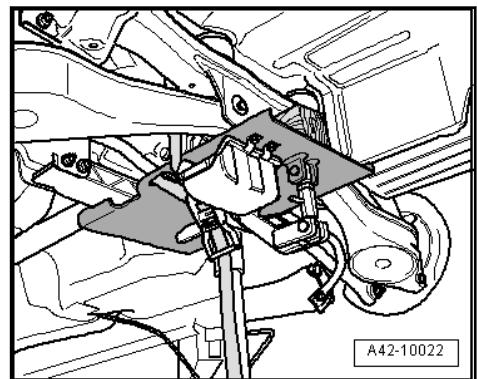
- Now secure the vehicle on both sides to the hoist lifting arms with Tensioning Strap -T10038-.



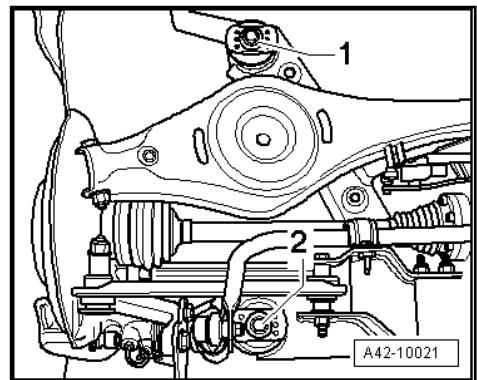
WARNING

If vehicle is not secured, it could slide off of hoist.

- Place the Engine and Gearbox Jack -VAS 6931- with Universal Support Plate -V.A.G 1359/2- below subframe and secure with strap.



- Remove the hex bolt -1- or -2- on both sides.

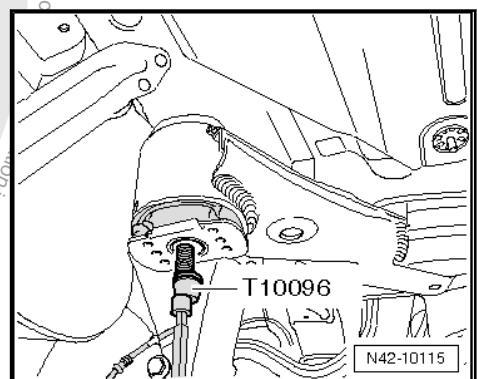


Note

For clarity only the left side of the vehicle is shown.

To secure the subframe, Locating Pins -T10096- must be screwed in one after the other on both sides of the vehicle at positions -1- and -2-.

- Secure the position of the subframes using two Locating Pins -T10096- to 20 Nm.



Note

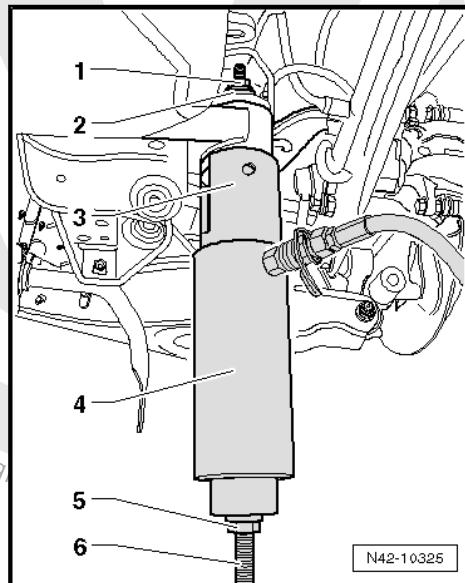
Locating Pins -T10096- may only be tightened to a maximum of 20 Nm, otherwise the threads on the locating pins will be damaged.



- Replace the bolts of the subframe one after the other on both sides using Locating Pins -T10096- and tighten them to 20 Nm.

The subframe position is now secured.

- Lower subframe 10 cm using Engine and Gearbox Jack -VAS 6931-.
- Mark the installation position of bonded rubber bushing to subframe, for example, with a felt-tip pen.
- Install the special tools as shown.



1 - Hydraulic Press - Rear Subframe Bushing Tool Kit - Nut -T10263/5-

2 - Sleeve, from Hydraulic Press - Rear Subframe Bushing Tool Kit -T10263-

3 - Hydraulic Press - Rear Subframe Bushing Tool Kit - Tube -T10263/6-

4 - Hydraulic Press -VAS 6178- with Bearing Installer - Wheel Hub/Bearing Kit- Adapter 13 -T10205/13-

5 - Hydraulic Press - Rear Subframe Bushing Tool Kit - Nut -T10263/5-

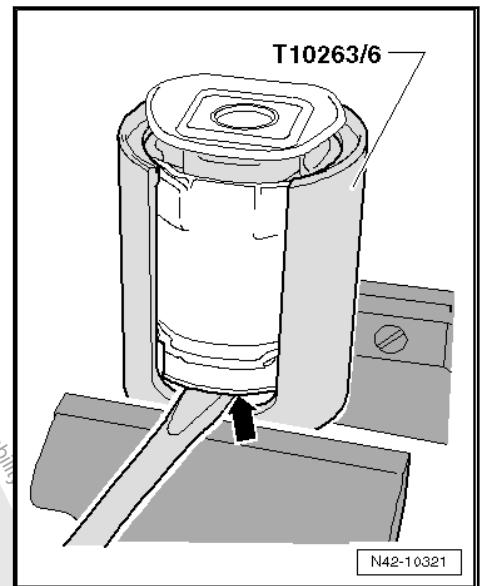
6 - Hydraulic Press - Rear Subframe Bushing Tool Kit-Spindle -T10263/4-

- Pretension the special tools.
- Pull out the bonded rubber bushing by operating the pump.

 Note

The bearing outer race is sheared off when the bonded rubber bushing is removed. There is a loud crack when this happens.

- After removing the rubber bonded bushing, it must then be removed from the Hydraulic Press - Rear Subframe Bushing Tool Kit - Pipe -T10263/6-.

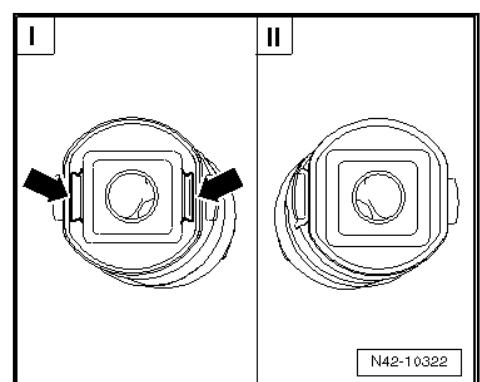


- Mount the Hydraulic Press - Rear Subframe Bushing Tool Kit - Pipe -T10263/6- on the provided surfaces in a vise.
- Pry a screwdriver between the Hydraulic Press - Rear Subframe Bushing Tool Kit - Pipe -T10263/6- and the rubber bonded bushing -arrow- and, if necessary, remove the bushing by tapping lightly with a hammer on the drift.

Installing the front bonded rubber bushing

Install in reverse order of removal. Observe the following when doing so:

Bonded rubber bushing characteristics



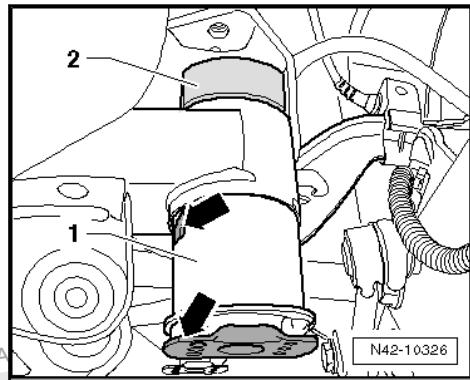
I - Front Bonded Rubber Bushing

II - Rear Bonded Rubber Bushing

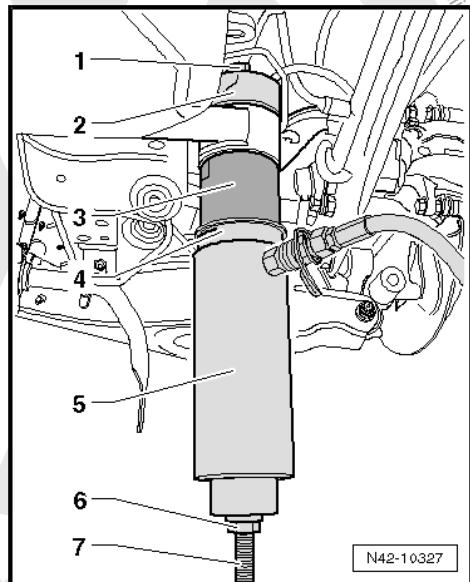
The front rubber bonded bushing had two notches -arrows- on top and have slightly different installation heights ⇒ Electronic Parts Catalog (ETKA).

Bonded rubber bushing must be installed in the correct direction, note marking on subframe.

- Install the rubber bonded bushing -1- into the subframe, so that the tab and the plate -arrows- face perpendicular to direction of travel.



- Mount the Hydraulic Press - Rear Subframe Bushing Tool Kit - Pressure Piece -T10263/3- -2- so that the flat side faces perpendicular to direction of travel.
- Insert the special tools with bonded rubber bushing into the subframe as shown.



1 - Hydraulic Press - Rear Subframe Bushing Tool Kit - Nut
-T10263/5-

2 - Hydraulic Press - Rear Subframe Bushing Tool Kit - Pres-
sure Piece -T10263/3-

3 - Bonded Rubber Bushing

4 - Hydraulic Press - Rear Subframe Bushing Tool Kit - Thrust
Piece -T10263/2-

5 - Hydraulic Press - VAS 6178- with Bearing Installer - Wheel
Hub/Bearing Kit- Adapter 13 -T10205/13-

6 - Hydraulic Press - Rear Subframe Bushing Tool Kit - Nut
-T10263/5-

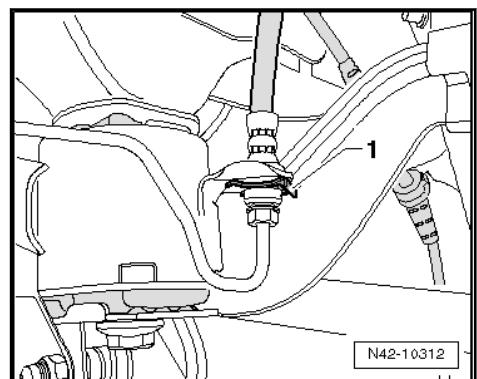
7 - Hydraulic Press - Rear Subframe Bushing Tool Kit-Spindle
-T10263/4-

- Pretension the special tool with the bonded rubber bushing.
- Carefully insert the bonded rubber bushing by operating pump until collar lies on subframe »without a gap«.
- Install the tie rods. Refer to [R10.5 od, Removing and Installing](#), page 258 .

- Install the stabilizer bar. Refer to [⇒ B13.1 ar, Removing and Installing](#), page 290 .
- Connect the connections between the rear axle and the body.
- Install the exhaust system rear muffler. Refer to ⇒ Rep. Gr. 26; Exhaust System; Exhaust System Parts, Removing and Installing.
- Install the coil springs. Refer to [⇒ S12.1 pring, Removing and Installing](#), page 282 .
- Mount the rear wheels.

Pulling out rear bonded rubber bushing

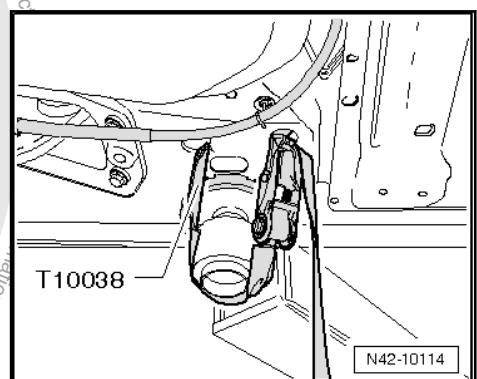
- Remove the rear wheels.
- Remove the coil springs. Refer to [⇒ S12.1 pring, Removing and Installing](#), page 282 .
- Remove the exhaust system rear muffler. Refer to ⇒ Rep. Gr. 26; Exhaust System; Exhaust System, Removing and Installing.
- Remove the clip -1-.



Note

Do not disconnect the brake line.

- Now secure the vehicle on both sides to the hoist lifting arms with Tensioning Strap -T10038-.



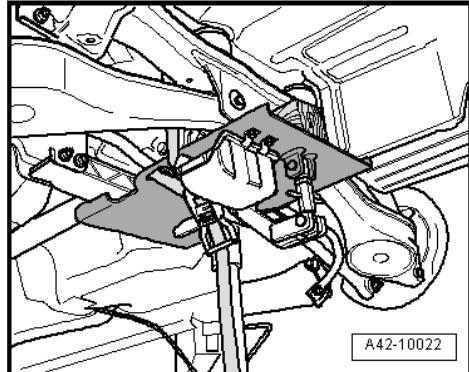
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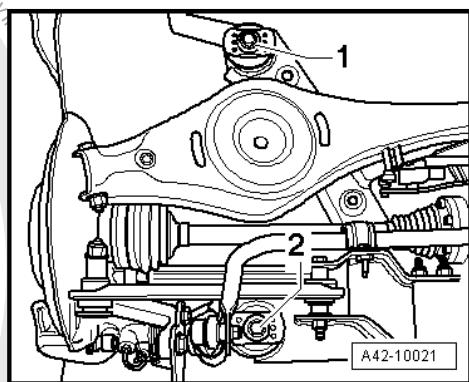
WARNING

If vehicle is not secured, it could slide off of hoist.

- Place the Engine and Gearbox Jack -VAS 6931- with Universal Support Plate -V.A.G 1359/2- below subframe and secure with strap.



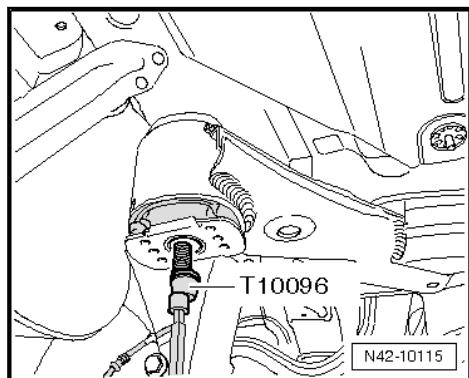
- Remove the hex bolt -1- or -2- on both sides.



For clarity only the left side of the vehicle is shown.

To secure the subframe, Locating Pins -T10096- must be screwed in one after the other on both sides of the vehicle at positions -1- and -2-.

- Location position of subframe with Locating Pins -T10096-.





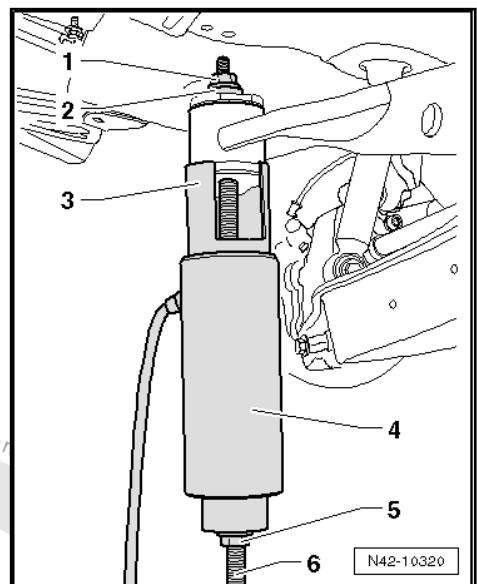
Note

Locating Pins -T10096- may only be tightened to a maximum of 20 Nm, otherwise the threads on the locating pins will be damaged.

- Replace the bolts of the subframe one after the other on both sides using Locating Pins -T10096- and tighten them to 20 Nm.

The subframe position is now secured.

- Lower subframe 10 cm using Engine and Gearbox Jack -VAS 6931-.
- Mark the installation position of bonded rubber bushing to subframe, for example, with a felt-tip pen.
- Install the special tools as shown.



1 - Hydraulic Press - Rear Subframe Bushing Tool Kit - Nut -T10263/5-

2 - Sleeve, from Hydraulic Press - Rear Subframe Bushing Tool Kit -T10263-

3 - Hydraulic Press - Rear Subframe Bushing Tool Kit - Tube -T10263/6-

4 - Hydraulic Press -VAS 6178- with Bearing Installer - Wheel Hub/Bearing Kit- Adapter 13 -T10205/13-

5 - Hydraulic Press - Rear Subframe Bushing Tool Kit - Nut -T10263/5-

6 - Hydraulic Press - Rear Subframe Bushing Tool Kit-Spindle -T10263/4-

- Pretension the special tools.
- Pull out the bonded rubber bushing by operating the pump.

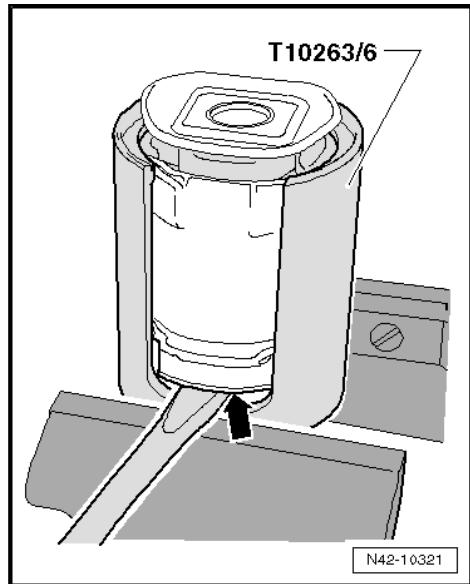


Note

The bearing outer race is sheared off when the bonded rubber bushing is removed. There is a loud crack when this happens.



- After removing the rubber bonded bushing, it must then be removed from the Hydraulic Press - Rear Subframe Bushing Tool Kit - Pipe -T10263/6-.

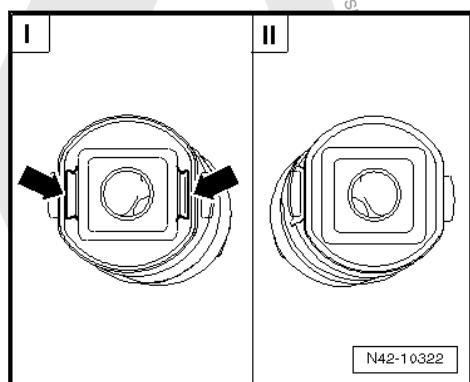


- Mount the Hydraulic Press - Rear Subframe Bushing Tool Kit - Pipe -T10263/6- on the provided surfaces in a vise
- Pry a screwdriver between the Hydraulic Press - Rear Subframe Bushing Tool Kit - Pipe -T10263/6- and the rubber bonded bushing -arrow- and, if necessary, remove the bushing by tapping lightly with a hammer on the drift.

Rear bonded rubber bushing, installing

Install in reverse order of removal. Observe the following when doing so:

Bonded rubber bushing characteristics



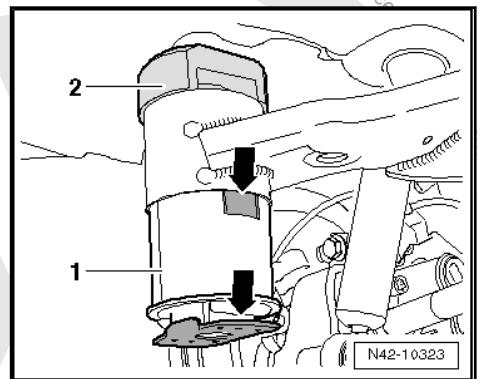
I - Front Bonded Rubber Bushing

II - Rear Bonded Rubber Bushing

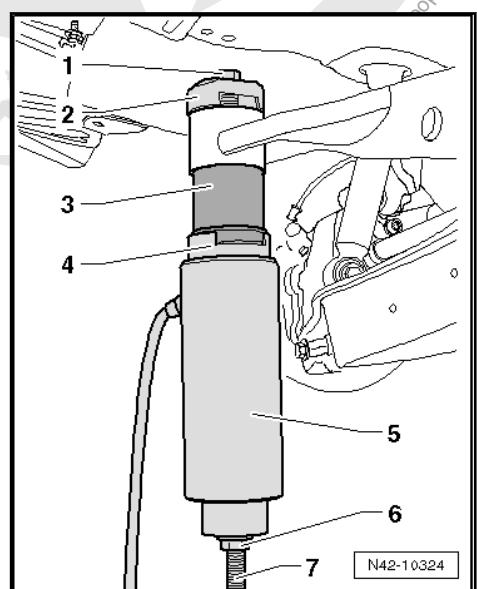
The front rubber bonded bushing had two notches -arrows- on top and have slightly different installation heights ⇒ Electronic Parts Catalog (ETKA).

Bonded rubber bushing must be installed in the correct direction, note marking on subframe.

- Install the rubber bonded bushing -1- into the subframe, so that the tab and the plate -arrows- face perpendicular to direction of travel.



- Mount the Hydraulic Press - Rear Subframe Bushing Tool Kit - Pressure Piece -T10263/3- -2-so that the flat side faces perpendicular to direction of travel.
- Insert the special tools with bonded rubber bushing into the subframe as shown.



1 - Hydraulic Press - Rear Subframe Bushing Tool Kit - Nut
 -T10263/5-

2 - Hydraulic Press - Rear Subframe Bushing Tool Kit - Pressure Piece -T10263/3-

3 - Bonded Rubber Bushing

4 - Hydraulic Press - Rear Subframe Bushing Tool Kit - Thrust Piece -T10263/2-

5 - Hydraulic Press -VAS 6178- with Bearing Installer - Wheel Hub/Bearing Kit- Adapter 13 -T10205/13-

6 - Hydraulic Press - Rear Subframe Bushing Tool Kit - Nut
 -T10263/5-

7 - Hydraulic Press - Rear Subframe Bushing Tool Kit-Spindle
 -T10263/4-

- Pretension the special tool with the bonded rubber bushing.
- Carefully insert the bonded rubber bushing by operating pump until collar lies on subframe »without a gap«.
- Install the exhaust system rear muffler. Refer to ⇒ Rep. Gr. 26; Exhaust System; Exhaust System Parts, Removing and Installing.



- Install the coil springs. Refer to [S12.1 Spring, Removing and Installing, page 282](#).
- Mount the rear wheels.

Tightening Specifications

Component	Tightening Specification
Subframe to body ◆ Use new bolts.	90 Nm +90° additional turn

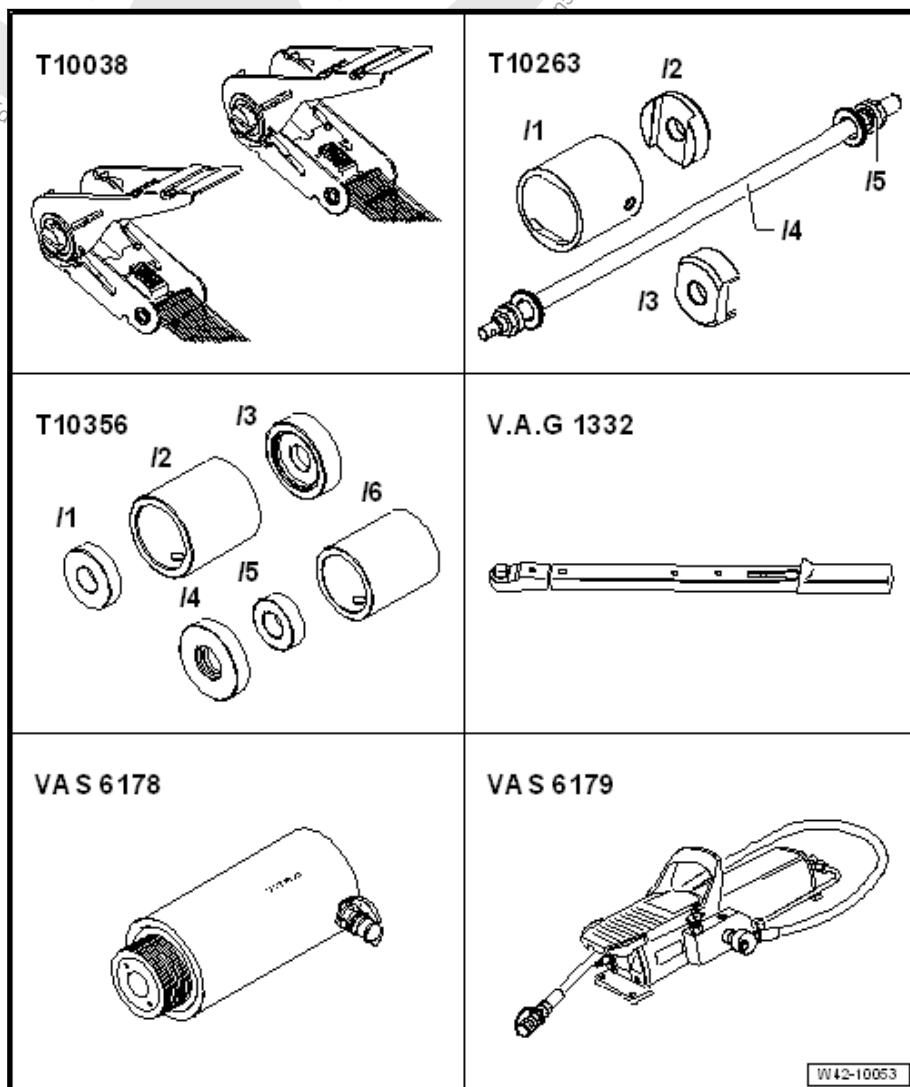
9.3 Subframe, Servicing, from 7/2/2012

⇒ [B9.3.1 bonded Rubber Bushing, Replacing", page 230](#)

⇒ [B9.3.2 bonded Rubber Bushing, Replacing", page 238](#)

9.3.1 Front Bonded Rubber Bushing, Replacing

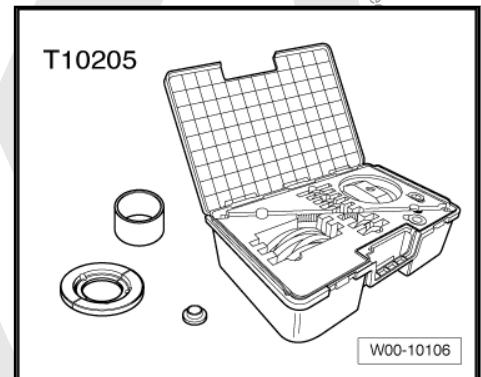
Special tools and workshop equipment required



- ◆ Tensioning Strap -T10038-
- ◆ Hydraulic Press - Rear Subframe Bushing Tool Kit -T10263-
- ◆ Subframe Bushing Assembly Tool Kit -T10356-



- ◆ Engine and Gearbox Jack -VAS 6931-
- ◆ Hydraulic Press -VAS 6178-with Bearing Installer - Wheel Hub/Bearing Kit- Adapter 13 -T10205/13-
- ◆ Pneumatic/Hydraulic Foot Pump -VAS 6179-
- ◆ Bearing Installer - Wheel Hub/Bearing Kit -T10205-

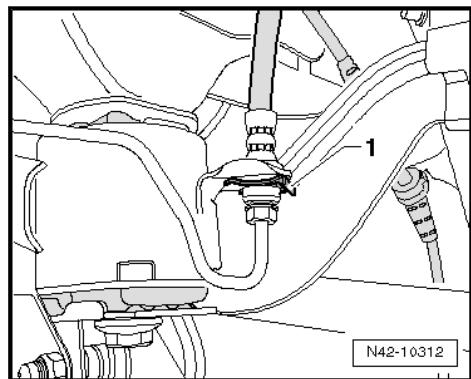


Note

- ◆ If a bonded rubber bushing is faulty, then the bonded rubber bushing on the opposite side must also be replaced. Refer to the ⇒ Electronic Parts Catalog (ETKA) for the allocation.
- ◆ Check the other bearing before switching out a defected bonded rubber bushing.
- ◆ If there are any tears or other visible damages, replace the bonded rubber bushing.
- ◆ To replace the bonded rubber bushing, the subframe must be lowered either at the front or at the rear. It is not necessary to remove the subframe.
- ◆ Identify the installation position to the subframe before removing the bonded rubber bushing.

Pressing out bonded rubber bushing, front

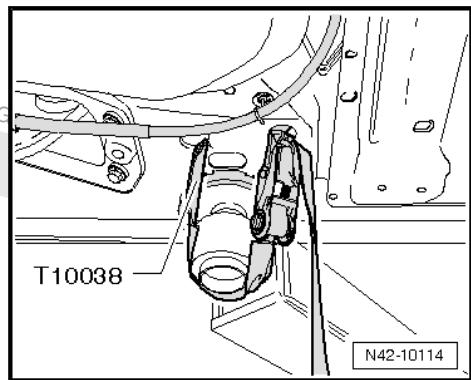
- Loosen the wheel bolts.
- Raise the vehicle.
- Remove the wheels.
- Remove the spring. Refer to ⇒ [S12.1 pring, Removing and Installing](#), page 282 .
- Remove the exhaust system rear muffler. Refer to ⇒ Rep. Gr. 26; Exhaust System; Exhaust System, Removing and Installing.
- Disconnect the electric connections between the rear axle and the body.
- Remove the stabilizer bar. Refer to ⇒ [B13.1 ar, Removing and Installing](#), page 290 .
- Remove the tie rods. Refer to ⇒ [R10.5 od, Removing and Installing](#), page 258 .
- Remove the clamps -1- on both sides of the vehicle.



 **Note**

Do not disconnect the brake line.

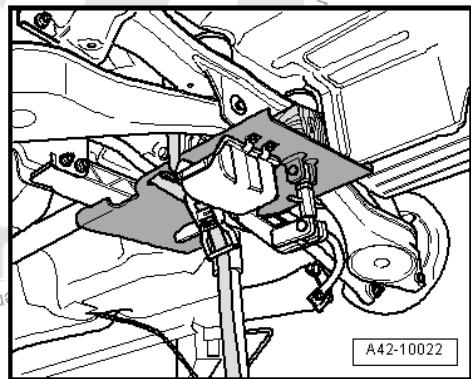
- Secure both sides of the vehicle on the hoist lifting arms using the Tensioning Straps -T10038-.



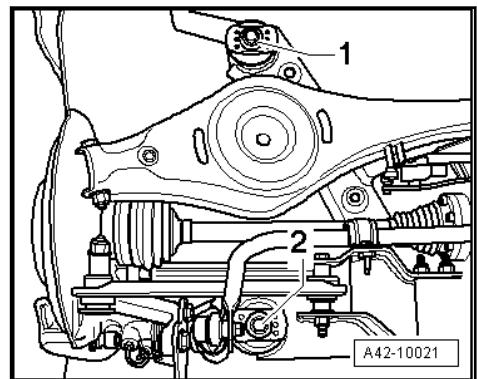
WARNING

The vehicle could slide off the hoist if it is not secured.

- Place the Engine and Gearbox Jack -VAS 6931- with Universal Support Plate -V.A.G 1359/2- below subframe and secure with strap.



- Remove the hex bolt -1- or -2- on both sides.

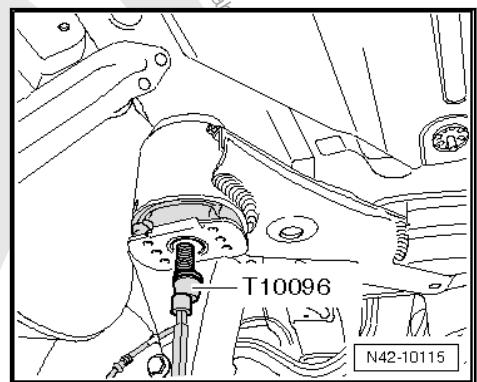


Note

For clarity only the left side of the vehicle is shown.

To secure the subframe, Locating Pins -T10096- must be screwed in one after the other on both sides of the vehicle at positions -1- and -2-.

- Secure the position of the subframes using two Locating Pins -T10096- to 20 Nm.



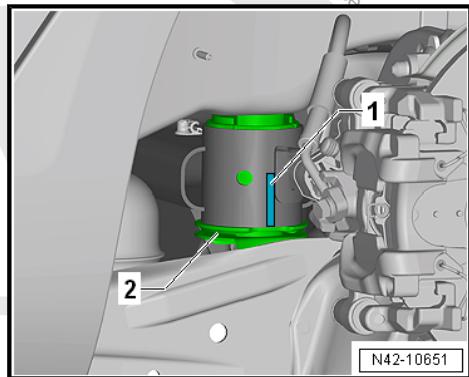
Note

Locating Pins -T10096- may only be tightened to a maximum of 20 Nm, otherwise the threads on the locating pins will be damaged.

- Replace the bolts of the subframe one after the other on both sides using Locating Pins -T10096- and tighten them to 20 Nm.

The subframe position is now secured.

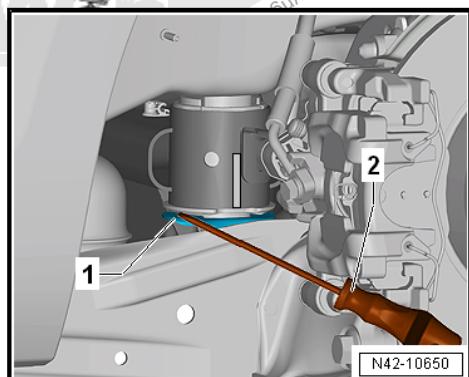
- Mark the installation location of the bonded rubber bushing on the subframe with a felt-tip pen -1-.



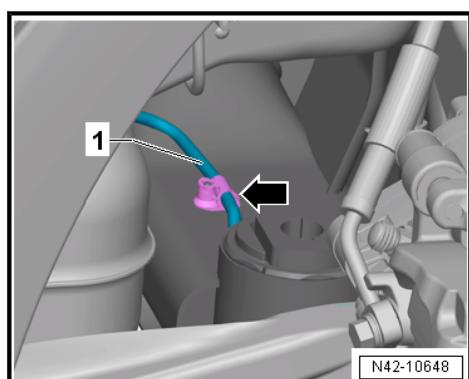
 Note

Apply the mark -1- on the subframe in the middle of the recess on the bonded rubber mounting -2-.

- Use a screwdriver -2- to pry off the anti-twist mechanism -1- near the bonded rubber bushing retaining tabs.



- Lower the subframe approximately 100 mm using the Engine and Gearbox Jack -VAS 6931-.
- Unclip the brake line -1- from the clip -arrow- on the left side.



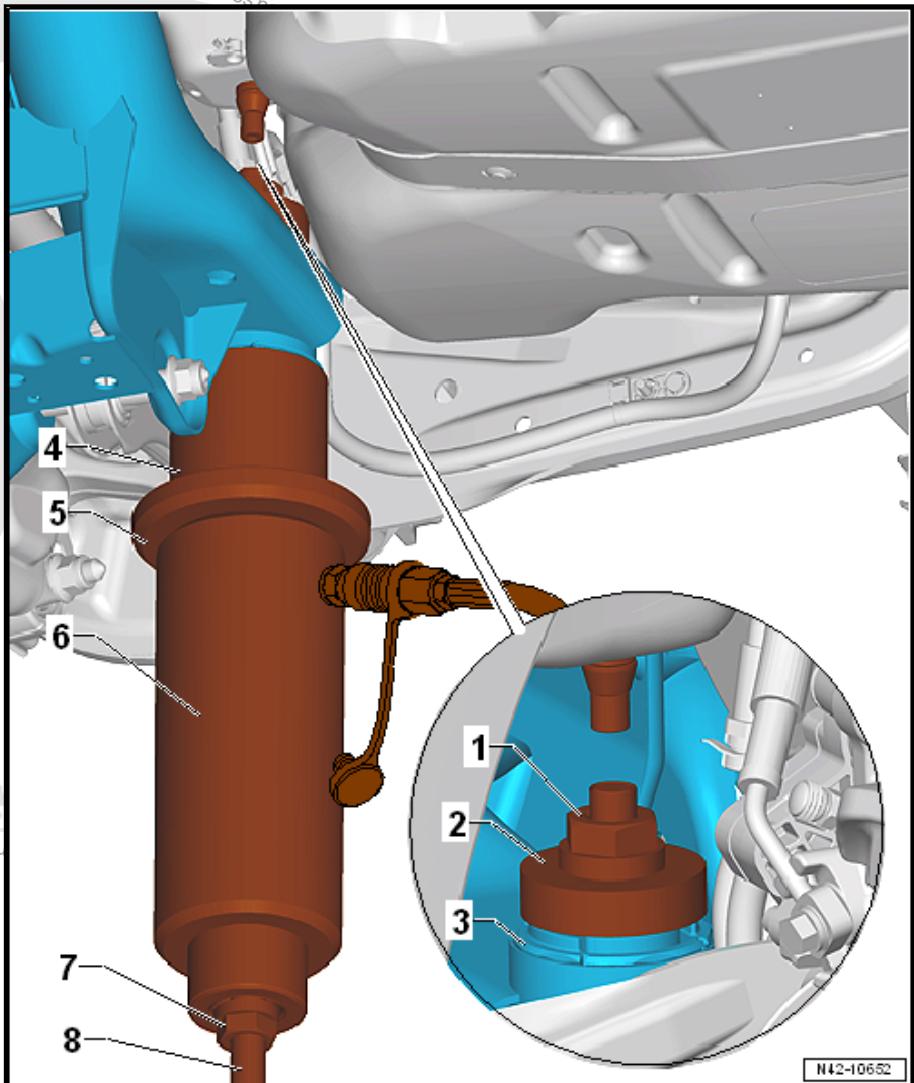
 Note

This will destroy the clip, so it will have to be replaced.

- Use the special tools as shown.



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- 1 - Hydraulic Press - Rear Subframe Bushing Tool Kit - Nut
-T10263/5-
- 2 - Subframe Bushing Assembly Tool Kit-Press Piece -
T10356/1-
- 3 - Subframe
- 4 - Subframe Bushing Assembly Tool Kit-Pipe -T10356/2-, side
with shoulder points to subframe
- 5 - Bearing Installer - Wheel Hub/Bearing Kit - Gripping Device
-T10205/1-
- 6 - Hydraulic Press -VAS 6178- with Bearing Installer - Wheel
Hub/Bearing Kit Pressure Head -T10205/13-
- 7 - Hydraulic Press - Rear Subframe Bushing Tool Kit - Nut
-T10263/5-
- 8 - Hydraulic Press - Rear Subframe Bushing Tool Kit-Threaded
Rod -T10263/4-
 - Pretension the special tools.
 - Press out the bonded rubber bushing.

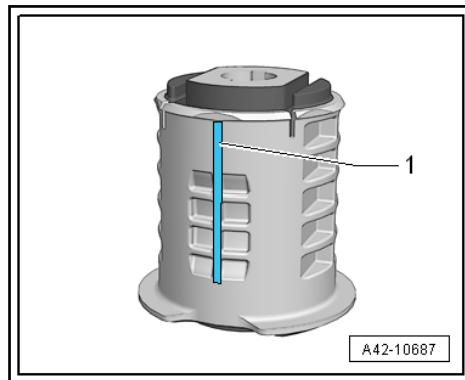


Note

- ◆ When removing the bonded rubber bushing, the outer race collar on the bushing is sheared off. There is a loud crack when this happens.
- ◆ After removing the bonded rubber bushing, it must be removed from the Tube -T10356/2- by tapping lightly with a hammer.

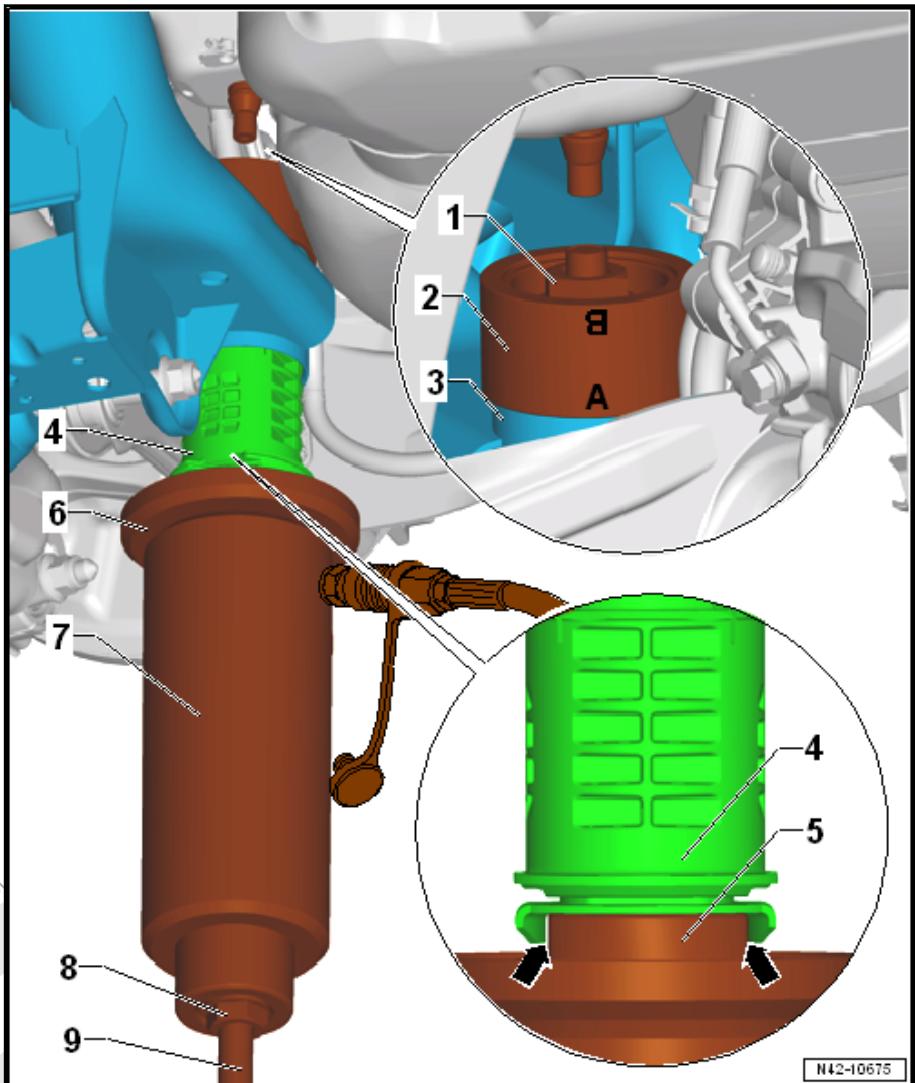
Press in on the front bonded rubber bushing

- Apply a line -1- on the vertical rib of the bonded rubber bushing to help mount.



- Apply mounting paste to the outer edge of the bonded rubber bushing.
- Insert the special tools with bonded rubber bushing into the subframe as shown.





1 - Hydraulic Press - Rear Subframe Bushing Tool Kit - Nut
-T10263/5-

2 - Subframe Bushing Assembly Tool Kit-Thrust piece -
T10356/7- – the mark -A- points to the subframe

3 - Subframe

4 - Adjust the bonded rubber bushing to the marks made previously (the marks need to align)

5 - Assembly Tool - Bushing -T10356/8- - the flattened sides
need to fit into the cover of the bonded rubber bushing -arrows-.

6 - Bearing Installer - Wheel Hub/Bearing Kit - Gripping Device
-T10205/1-

7 - Hydraulic Press -VAS 6178- with Bearing Installer - Wheel
Hub/Bearing Kit Pressure Head -T10205/13-

8 - Hydraulic Press - Rear Subframe Bushing Tool Kit - Nut
-T10263/5-

9 - Hydraulic Press - Rear Subframe Bushing Tool Kit - Threaded Rod -T10263/4-

- Check the position of the bonded rubber bushing and, if necessary, align and pre-tighten special tools with bonded rubber bushing.



Note

- ◆ Make sure that the hose from the Hydraulic Press -VAS 6178- to the Pneumatic/Hydraulic Foot Pump -VAS 6179- runs between the trailing arm and the fuel tank when installed.
- ◆ Make sure that the bonded rubber bushing is not bent when installing. Otherwise the outer race could get damaged.

Operate the pump to press in the bonded rubber bushing until the collar is positioned on the subframe »without play«.

Further installation is performed in reverse order of the removal.
Note the following:

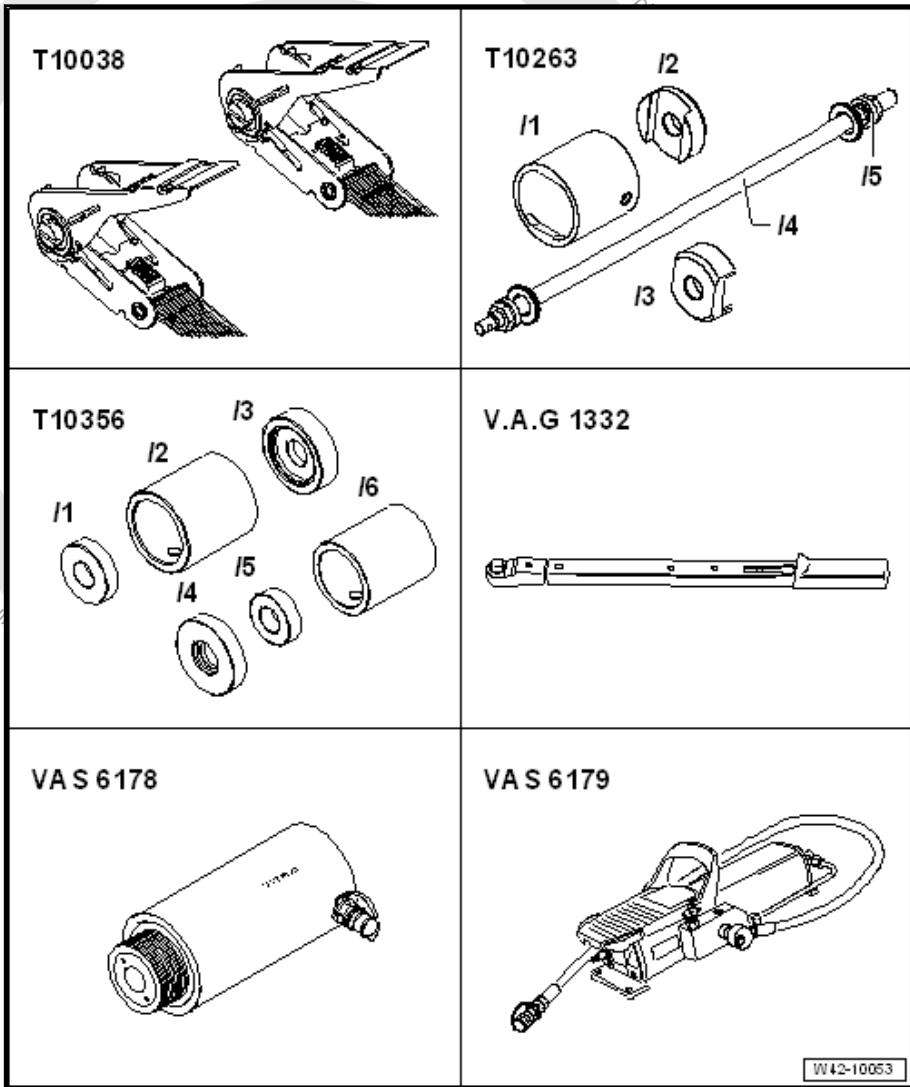
Tightening Specifications

Component	Tightening Specification
Subframe to body ◆ Use new bolts.	90 Nm +90° additional turn

9.3.2 Rear Bonded Rubber Bushing, Replacing



Special tools and workshop equipment required

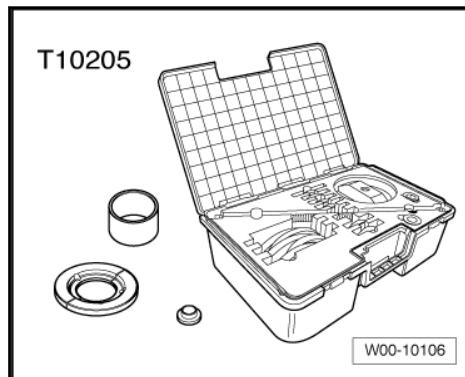


W42-10053

- ◆ Tensioning Strap -T10038-
- ◆ Hydraulic Press - Rear Subframe Bushing Tool Kit -T10263-
- ◆ Subframe Bushing Assembly Tool Kit -T10356-
- ◆ Engine and Gearbox Jack -VAS 6931-
- ◆ Hydraulic Press -VAS 6178- with Bearing Installer - Wheel Hub/Bearing Kit- Adapter 13 -T10205/13-
- ◆ Pneumatic/Hydraulic Foot Pump -VAS 6179-



- ◆ Bearing Installer - Wheel Hub/Bearing Kit -T10205-

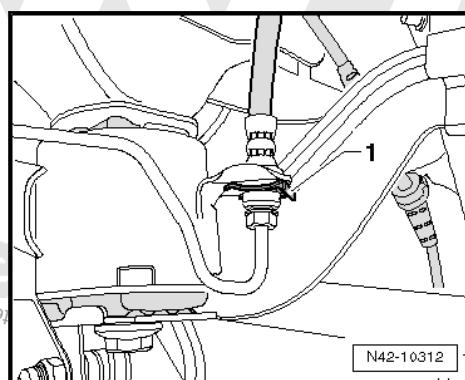


 Note

- ◆ If a bonded rubber bushing is faulty, then the bonded rubber bushing on the opposite side must also be replaced. Refer to the ⇒ Electronic Parts Catalog (ETKA) for the allocation.
- ◆ Check the other bearing before switching out a defected bonded rubber bushing.
- ◆ If there are any tears or other visible damages, replace the bonded rubber bushing.
- ◆ To replace the bonded rubber bushing, the subframe must be lowered either at the front or at the rear. It is not necessary to remove the subframe.
- ◆ Identify the installation position to the subframe before removing the bonded rubber bushing.

Pressing out rear bonded rubber bushing

- Loosen the wheel bolts.
- Raise the vehicle.
- Remove the wheels.
- Remove the spring. Refer to ⇒ [S12.1 Spring, Removing and Installing](#), page 282 .
- Remove the exhaust system rear muffler. Refer to ⇒ Rep. Gr. 26; Exhaust System; Exhaust System, Removing and Installing.
- Remove the clamps -1- on both sides of the vehicle.

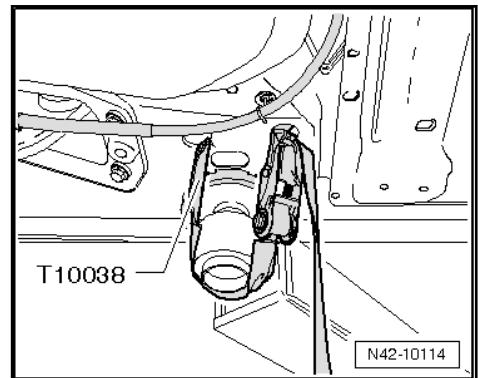




Note

Do not disconnect the brake line.

- Secure both sides of the vehicle on the hoist lifting arms using the Tensioning Straps -T10038-.



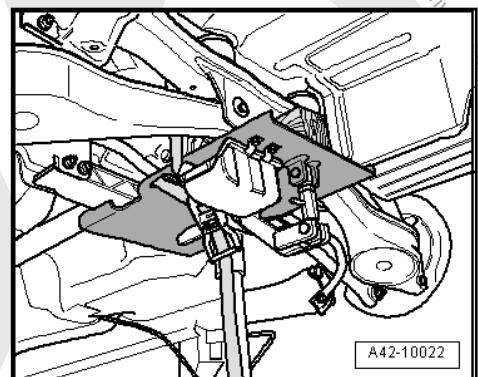
1 - Tensioning Strap -T10038-



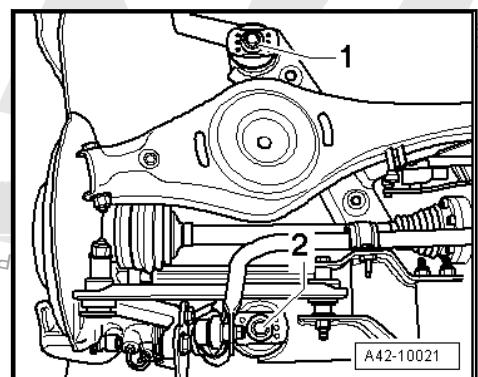
WARNING

The vehicle could slide off the hoist if it is not secured.

- Place the Engine and Gearbox Jack -VAS 6931- with Universal Support Plate -V.A.G 1359/2- below subframe and secure with strap.



- Remove the hex bolt -1- or -2- on both sides.



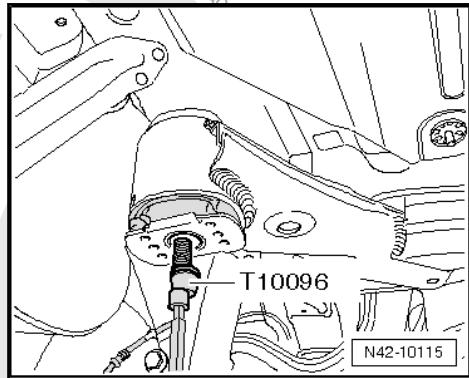


Note

For clarity only the left side of the vehicle is shown.

To secure the subframe, Locating Pins -T10096- must be screwed in one after the other on both sides of the vehicle at positions -1- and -2-.

- Location position of subframe with Locating Pins -T10096-.



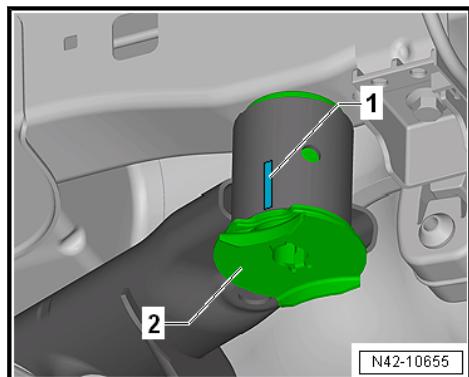
Note

Locating Pins -T10096- may only be tightened to a maximum of 20 Nm, otherwise the threads on the locating pins will be damaged.

- Replace the bolts of the subframe one after the other on both sides using Locating Pins -T10096- and tighten them to 20 Nm.

The subframe position is now secured.

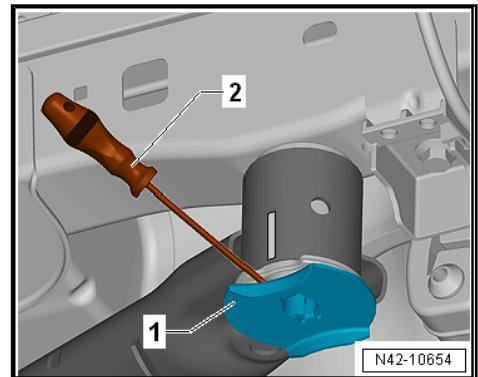
- Mark the installation location of the bonded rubber bushing on the subframe with a felt-tip pen -1-.



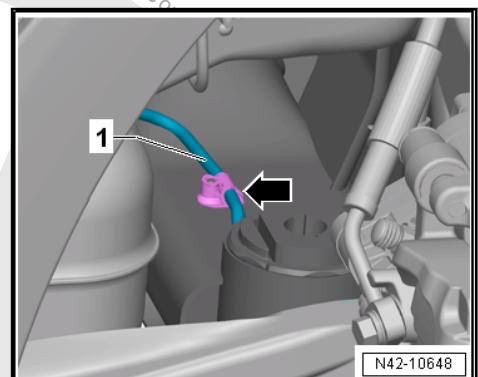
Note

Apply the mark -1- on the subframe in the middle of the recess on the bonded rubber mounting -2-.

- Use a screwdriver -2- to pry off the anti-twist mechanism -1- near the bonded rubber bushing retaining tabs.



- Lower the subframe approximately 100 mm using the Engine and Gearbox Jack -VAS 6931-.
- Unclip the brake line -1- from the clip -arrow- on the left side.

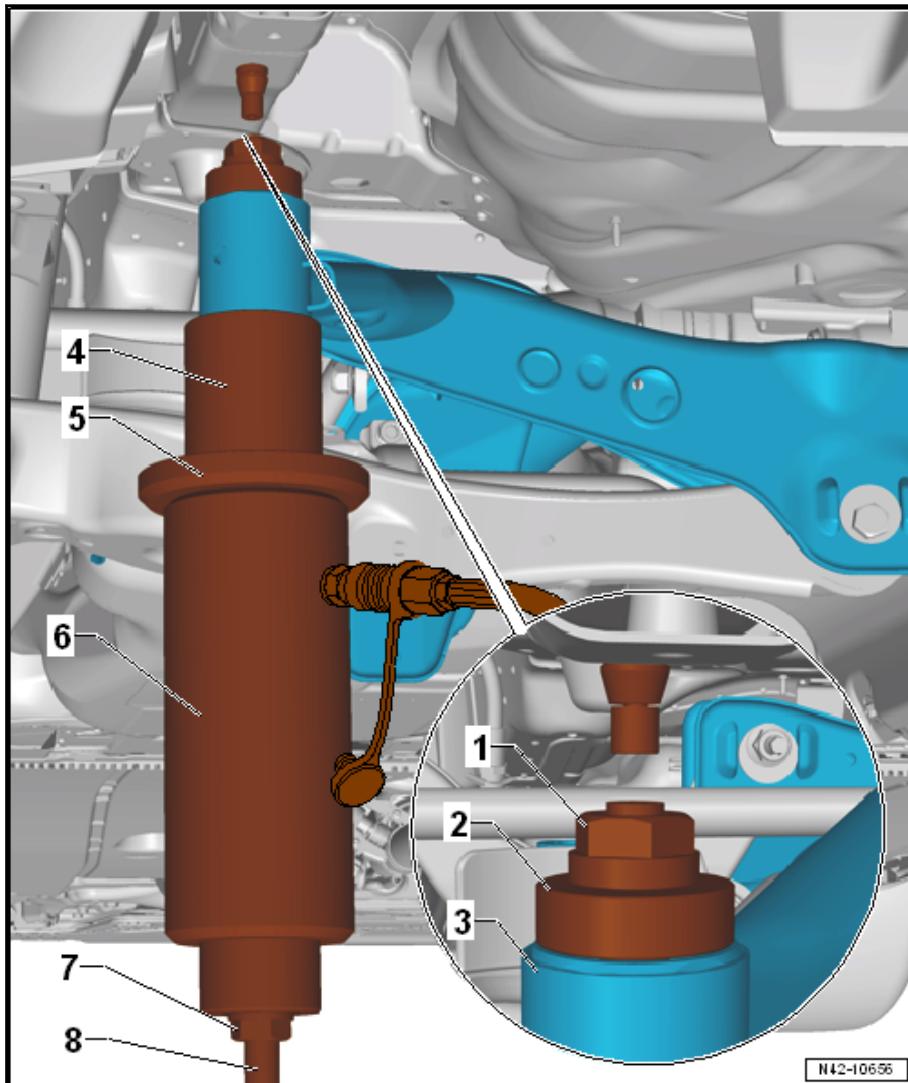


Note

This will destroy the clip, so it will have to be replaced.

- Use the special tools as shown.





1 - Hydraulic Press - Rear Subframe Bushing Tool Kit - Nut
-T10263/5-

2 - Subframe Bushing Assembly Tool Kit - Thrust Piece -
T10356/5-

3 - Subframe

4 - Subframe Bushing Assembly Tool Kit - Tube - T10356/4-
side with offset points to subframe

5 - Bearing Installer - Wheel Hub/Bearing Kit - Gripping Device
-T10205/1-

6 - Hydraulic Press -VAS 6178- with Bearing Installer - Wheel
Hub/Bearing Kit Pressure Head -T10205/13-

7 - Hydraulic Press - Rear Subframe Bushing Tool Kit - Nut
-T10263/5-

8 - Hydraulic Press - Rear Subframe Bushing Tool Kit-Threaded
Rod -T10263/4-

- Pretension the special tools.
- Press out the bonded rubber bushing.

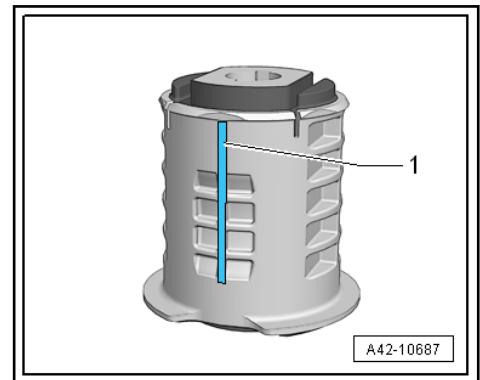


Note

- ◆ When removing the bonded rubber bushing, the outer race collar on the bushing is sheared off. There is a loud crack when this happens.
- ◆ After removing the bonded rubber bushing, it must be removed from the Subframe Bushing Assembly Tool Kit - Tube -T10356/6- by tapping lightly with a hammer.

Press in the rear bonded rubber bushing

- Apply a line -1- on the vertical rib of the bonded rubber bushing to help mount.

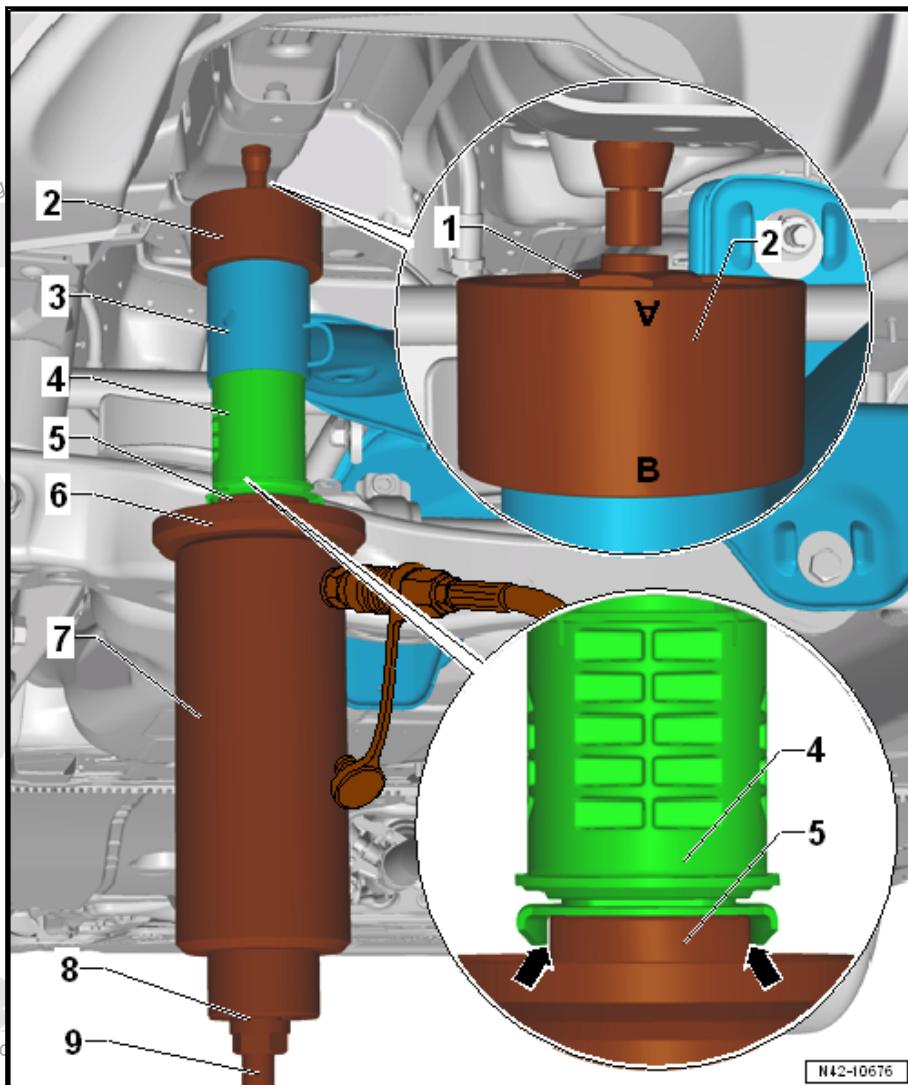


- Apply mounting paste to the outer edge of the bonded rubber bushing.
- Insert the special tools with bonded rubber bushing into the subframe as shown.





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1 - Hydraulic Press - Rear Subframe Bushing Tool Kit - Nut
-T10263/5-

2 - Assembly Tool - Bushing -T10356/7- - the marking -B- points to the subframe

3 - Subframe

4 - Adjust the bonded rubber bushing to the marks made previously (the marks need to align)

5 - Assembly Tool - Bushing -T10356/8- - the flattened sides need to fit into the cover of the bonded rubber bushing -arrows-.

6 - Bearing Installer - Wheel Hub/Bearing Kit - Gripping Device
-T10205/1-

7 - Hydraulic Press -VAS 6178- with Bearing Installer - Wheel Hub/Bearing Kit Pressure Head -T10205/13-

8 - Hydraulic Press - Rear Subframe Bushing Tool Kit - Nut
-T10263/5-

9 - Hydraulic Press - Rear Subframe Bushing Tool Kit - Threaded Rod -T10263/4-

- Check the position of the bonded rubber bushing and, if necessary, align and pre-tighten special tools with bonded rubber bushing.



Note

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Make sure that the bonded rubber bushing is not bent when installing. Otherwise the outer race could get damaged.

- Operate the pump to press in the bonded rubber bushing until the collar is positioned on the subframe »without play«.

Further installation is performed in reverse order of the removal.
Note the following:

Tightening Specifications

Component	Tightening Specification
Subframe to body ◆ Use new bolts.	90 Nm +90° additional turn

10 Overview - Transverse Link, Tie Rod, AWD

- ⇒ [-10.1 Left Rear Level Control System SensorG76 ”, page 251](#)
- ⇒ [C10.2 ontrol System Sensor, Replacing”, page 252](#)
- ⇒ [T10.3 ransverse Link, Removing and Installing”, page 253](#)
- ⇒ [T10.4 ransverse Link, Removing and Installing”, page 255](#)
- ⇒ [R10.5 od, Removing and Installing”, page 258](#)

The -arrow- points in the direction of travel.





1 - Eccentric Screw

- Perform a vehicle alignment after loosening. Refer to [⇒ A8 alignment](#), page 340.
- do not turn more than 90° right or left (that is smallest to largest possible adjustment)

2 - Nut

- 95 Nm
- Self-locking
- when adjusting, can be loosened and tightened up to 5 times
- Always replace if removed
- Always tighten the threaded connections in curb weight position. Refer to [⇒ A8.2 xle in Curb Weight Position](#), page 207.

3 - Eccentric Washer

- Inner hole with tab

4 - Eccentric Screw

- Perform a vehicle alignment after loosening. Refer to [⇒ A8 alignment](#), page 340.
- do not turn more than 90° right or left (that is smallest to largest possible adjustment)

5 - Eccentric Washer

- Inner hole with tab

6 - Nut

- 95 Nm
- Self-locking
- when adjusting, can be loosened and tightened up to 5 times
- Always replace if removed
- Always tighten the threaded connections in curb weight position. Refer to [⇒ A8.2 xle in Curb Weight Position](#), page 207.



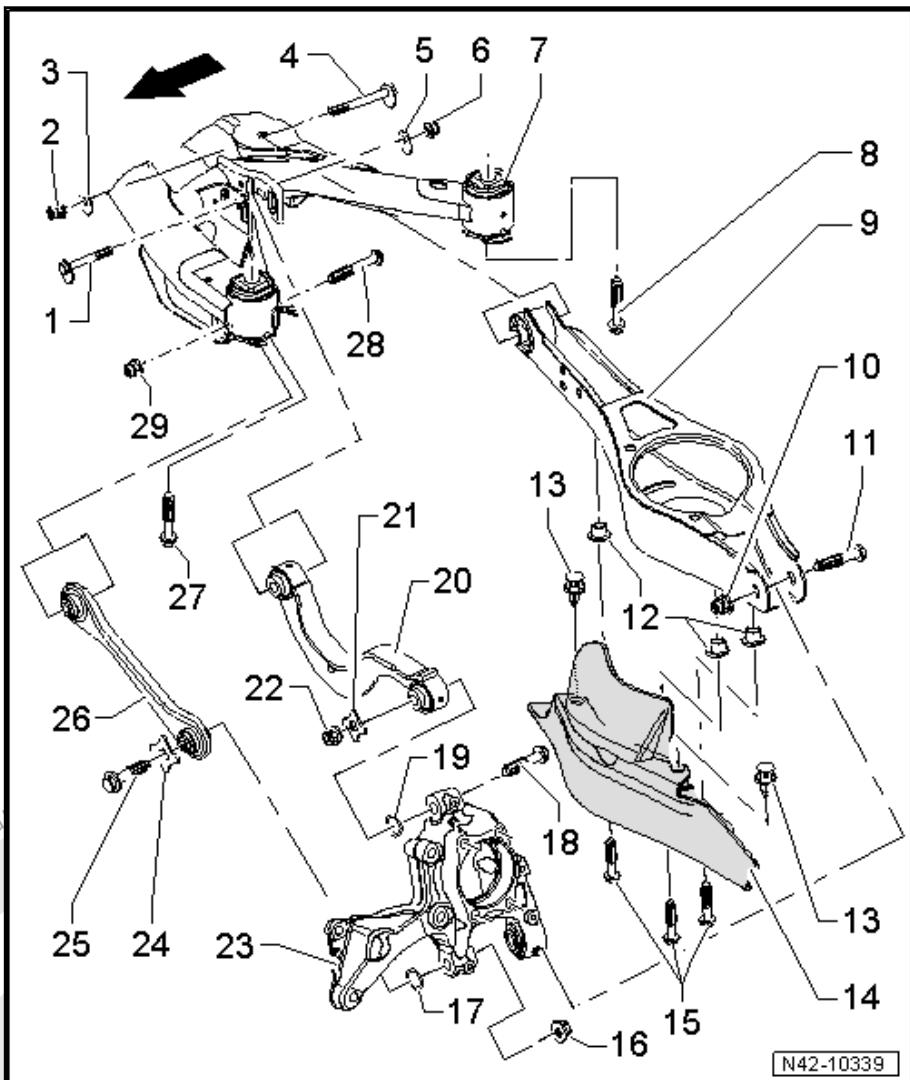
Note

- ◆ Adjust the Torque Wrench 40-200Nm - V.A.G 1332- to 80 Nm when tightening the nut.
- ◆ This tightening specification does only apply in conjunction with Insert Tool 18 - T10179.

7 - Subframe

8 - Bolt

- 90 Nm +90° additional turn





- Always replace if removed

9 - Lower Transverse Link

- Removing and Installing. Refer to [⇒ T10.4 Transverse Link, Removing and Installing”, page 255](#).

10 - Nut

- 90 Nm +90° additional turn
- Self-locking
- Always replace if removed
- Always tighten the threaded connections in curb weight position. Refer to [⇒ A8.2 axle in Curb Weight Position”, page 207](#).

11 - Bolt

- Always replace if removed

12 - Rivet

- M6

13 - Expanding Rivet

14 - Stone Chip Protection

15 - Hex Bolt

- M6 x 12
- 8 Nm

16 - Nut

- Self-locking
- Always replace if removed
- Always tighten the threaded connections in curb weight position. Refer to [⇒ A8.2 axle in Curb Weight Position”, page 207](#).

17 - Washer

18 - Bolt

- 130 Nm + 90° additional turn
- Always replace if removed
- Always tighten the threaded connections in curb weight position. Refer to [⇒ A8.2 axle in Curb Weight Position”, page 207](#).

19 - Washer

20 - Upper Transverse Link

- Removing and Installing. Refer to [⇒ T10.3 Transverse Link, Removing and Installing”, page 253](#).

21 - Washer

22 - Nut

- Self-locking
- Always replace if removed

23 - Wheel Bearing Housing

- Removing and Installing. Refer to [⇒ B11.1 bearing Housing, Removing and Installing”, page 265](#).
- A mixed installation with steel wheel bearing housings is permitted ⇒ Electronic Parts Catalog (ETKA).

24 - Washer

25 - Bolt

- 130 Nm + 90° additional turn
- Always replace if removed
- Always tighten the threaded connections in curb weight position. Refer to [⇒ A8.2 axle in Curb Weight Position”, page 207](#).

26 - Tie Rod

Opened downward (the right and left tie rods are the same)



- Removing and Installing. Refer to [⇒ R10.5 od, Removing and Installing", page 258](#).

27 - Bolt

- 90 Nm +90° additional turn
- Always replace if removed

28 - Bolt

- Always replace if removed
- Always tighten the threaded connections in curb weight position. Refer to [⇒ A8.2 xle in Curb Weight Position", page 207](#).

29 - Nut

- 90 Nm +90° additional turn
- Self-locking
- Always replace if removed

10.1 Overview - Left Rear Level Control System Sensor -G76-



Note

- ◆ *Level control system sensor is available as a replacement part only complete with the coupling rod and upper and lower retaining plates.*
- ◆ *Replacing with subframe installed. Refer to [⇒ C10.2 ontrol System Sensor, Replacing", page 252](#).*
- ◆ *Headlamp Range Control Module -J431-*





1 - Subframe

2 - Lower Transverse Link

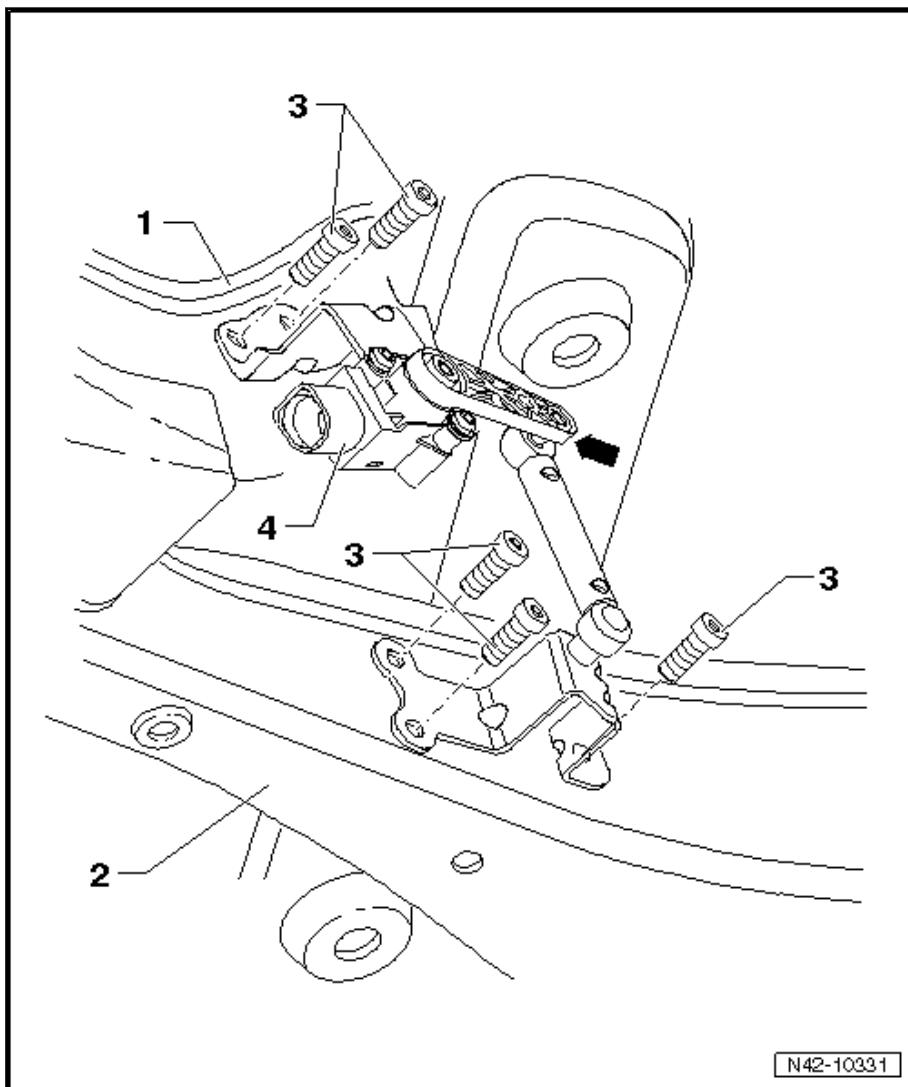
3 - Bolt

- M5 x 20
- 5 Nm

4 - Left Rear Level Control System Sensor -G76-

- Complete with attachments
- Lever -arrow- must point toward vehicle exterior
- Replace in vehicle. Refer to [C10.2 on-trol System Sensor, Replacing](#), page 252.
- After replacing, perform a basic setting for the headlamps

Use the → Vehicle diagnostic tester for the headlamp basic setting

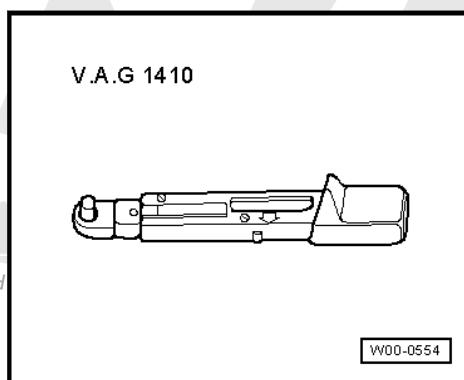


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10.2 Level Control System Sensor, Replacing

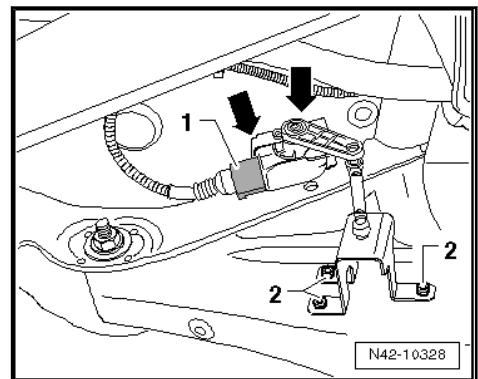
Special tools and workshop equipment required

- ◆ Torque Wrench -V.A.G 1410-



Removing

- Disconnect the connector -1-.



- Remove the bolts -2- from the lower transverse link.
- Remove bolts -arrows- from the subframe.
- Remove Left Rear Level Control System Sensor -G76-.

Installing

Install in reverse order of removal. Note the following:

The Left Rear Level Control System Sensor -G76- lever must point toward the outside of the vehicle.

- Perform a basic setting on the headlamps after replacing them using the ⇒ Vehicle diagnostic tester.

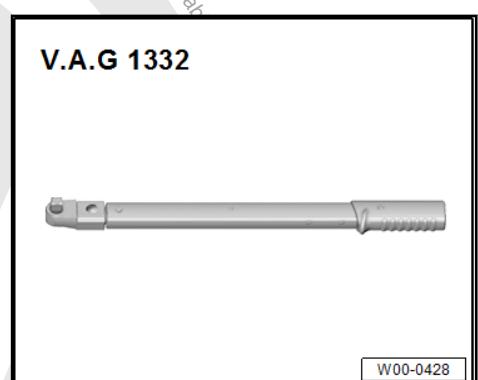
Tightening Specifications

Component	Tightening Specification
Left Rear Level Control System Sensor -G76- to lower transverse link and subframe	5 Nm

10.3 Upper Transverse Link, Removing and Installing

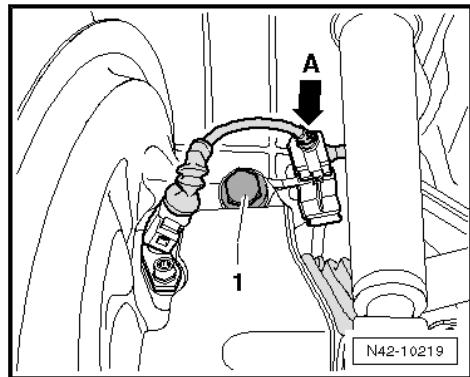
Special tools and workshop equipment required

- ◆ Torque Wrench, 40-200Nm -V.A.G 1332A-

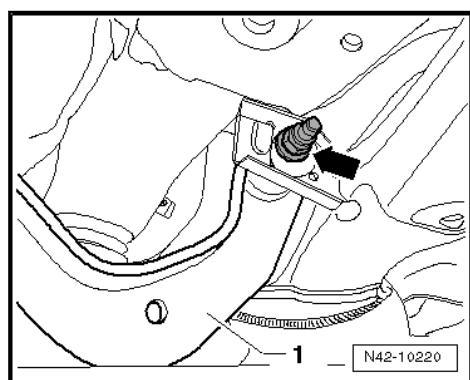


Removing

- Remove the wheel.
- Remove the coil spring. Refer to ⇒ [S12.1 pring, Removing and Installing](#), page 282.
- Unhook speed sensor wiring -arrow A- from the upper transverse link.



- Remove the bolt -1-.
- Mark, for example using a felt-tip marker, position of eccentric bolt -arrow- to subframe.



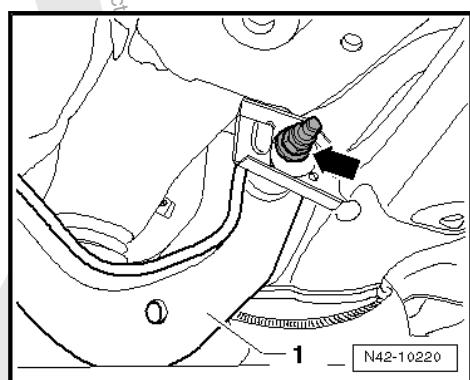
- Remove the bolt -arrow-.
- Remove the upper transverse link -1-.

Installing

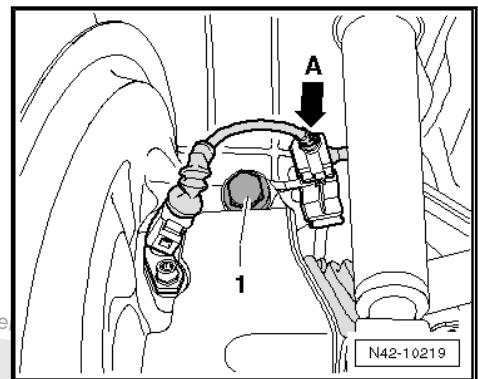
- Insert the upper transverse link into the vehicle and tighten the bolts by hand.

**Only bolt on transverse link if dimension "a" is reached! Refer to
⇒ Fig. “Measure dimension “a””, page 209 .**

- Fasten upper transverse link -1- to the subframe and tighten the new nut -arrow-.



- Note applied marking of the eccentric screw -arrow- to the subframe.
- Tighten the bolt -1- on the upper transverse link.



Note
Make sure that washer is installed between bolt and wheel bearing housing.

- Hook speed sensor wiring -arrow A- in at the upper transverse link.
- Install the coil spring. Refer to [⇒ S12.1 spring, Removing and Installing](#), page 282 .
- Install the wheel and tighten. Refer to [⇒ M2 Counting Tightening Specifications](#), page 315 .
- Perform vehicle alignment. Refer to [⇒ A8 Alignment](#), page 340 .

Tightening Specifications

Component	Tightening Specification
Upper transverse link to wheel-bearing housing ◆ Use a new bolt and nut ◆ Tighten bolts in curb weight position	130 Nm + 90° additional turn
Upper transverse link to subframe ◆ Use a new nut ◆ Tighten bolts in curb weight position	95 Nm ◆ Adjust the Torque Wrench 40-200Nm -V.A.G 1332- to 80 Nm when tightening the nut. ◆ Only applies in conjunction with Insert Tool SW 18 -T10179-.

10.4 Lower Transverse Link, Removing and Installing

Special tools and workshop equipment required

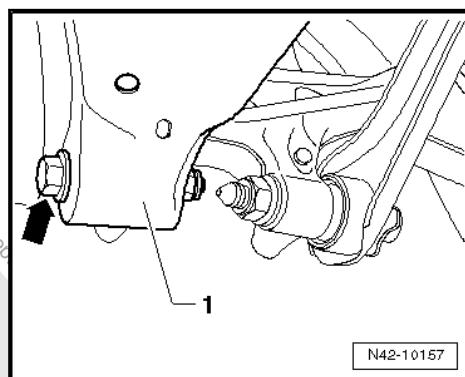


- ◆ Torque Wrench, 40-200Nm -V.A.G 1332A-



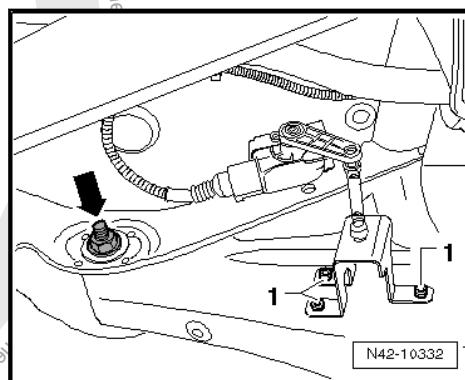
Removing

- Remove the wheel.
- Remove the coil spring. Refer to [S12.1 Spring, Removing and Installing, page 282](#).
- Remove the bolt -arrow- for the lower transverse link -1-.



Vehicles with automatic headlamp range control

- Remove the bolts -1- from the lower transverse link.



Continuation for all vehicles

- Mark, for example using a felt-tip marker, position of eccentric bolt -arrow- to subframe.
- Disengage the rear exhaust system and lower.
- Remove the bolt -arrow-.
- Remove the lower transverse link.

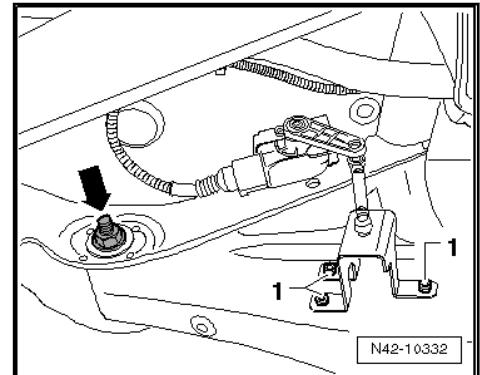


Installing

- Insert lower transverse link into vehicle and tighten the bolts by hand.

**Only bolt on transverse link if dimension "a" is reached! Refer to
⇒ Fig. "Measure dimension -a-", page 209 .**

- Connect the upper transverse link to the subframe and tighten the new nut -arrow- to the tightening specification only.



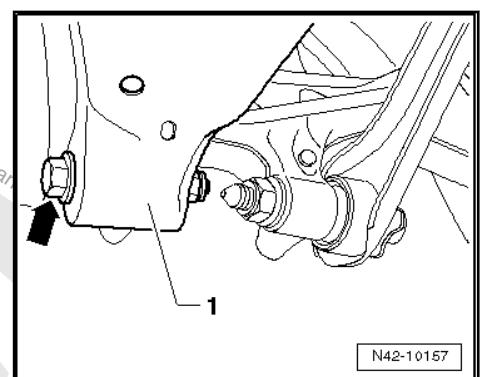
- Note applied marking of the eccentric screw -arrow- to the subframe.
- Suspend rear exhaust system.

Vehicles with automatic headlamp range control

- Install the bolts -1- to the lower transverse link.

Continuation for all vehicles

- Tighten bolt -arrow- for lower transverse link -1-.



- Install the coil spring. Refer to ⇒ [S12.1 Spring, Removing and Installing](#), page 282 .
- Install the wheel and tighten. Refer to ⇒ [M2 Counting Tightening Specifications](#), page 315 .
- Perform vehicle alignment. Refer to ⇒ [A8 Alignment](#), page 340 .

Tightening Specifications

Component	Tightening Specification
Lower transverse link to wheel bearing housing ◆ Use a new bolt and nut ◆ Tighten bolts in curb weight position	90 Nm +90° additional turn



Component	Tightening Specification
Lower transverse link to subframe ◆ Use a new nut ◆ Tighten bolts in curb weight position	95 Nm

10.5 Tie Rod, Removing and Installing

Special tools and workshop equipment required

- ◆ Torque Wrench, 6-50Nm -VAG 1331A-

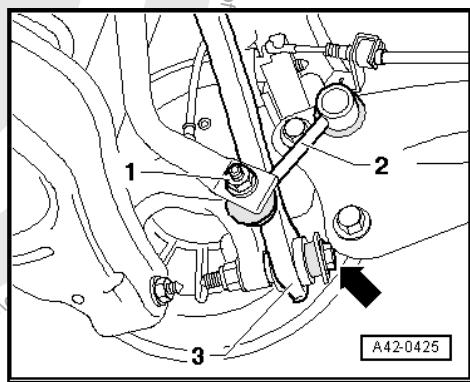


- ◆ Torque Wrench, 40-200Nm -V.A.G 1332A-



Removing

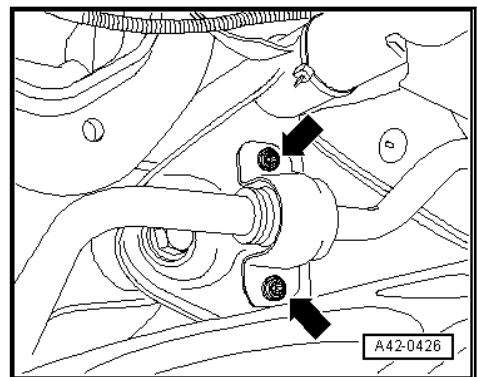
- Remove the wheel.
- Remove the coil spring. Refer to [S12.1 Spring, Removing and Installing](#), page 282.
- Remove the nut -1- and pull the coupling rod -2- out of the stabilizer bar.



- Remove the bolt -arrow- for tie rod -3-.



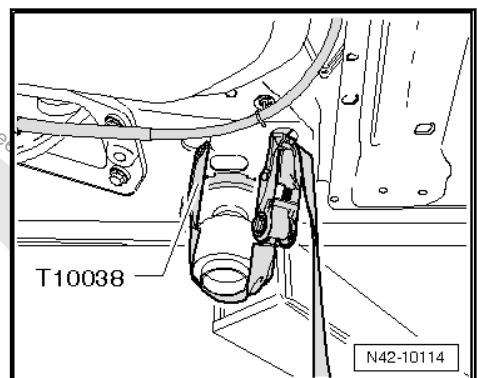
- Remove the bolts -arrows- for the stabilizer bar clamp.



If the upper bolts on the stabilizer bar clamp on the right side of the vehicle cannot be removed, then the following work steps must be performed [≥ page 259](#).

Only for the right vehicle side (depending on equipment)

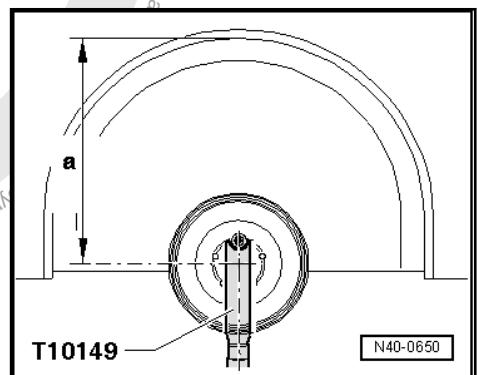
- Now secure the vehicle on both sides to the hoist lifting arms with Tensioning Strap -T10038-.



WARNING

If vehicle is not secured, it could slide off of hoist.

- Install the Engine/Gearbox Jack Adapter - Wheel Hub Support -T10149- with wheel bolt on wheel hub.

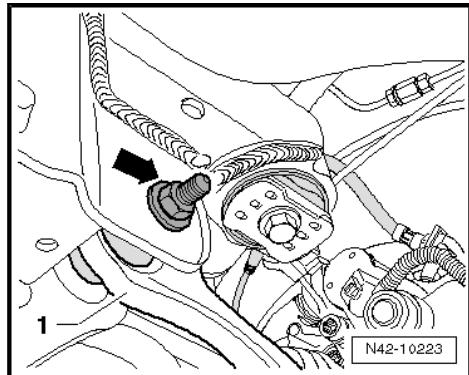


- Lift the wheel hub using the Engine/Gearbox Jack Adapter - Wheel Hub Support -T10149- and Engine and Gearbox Jack -VAS 6931- far enough until it is possible to access the bolts on the right stabilizer bar clamp.



Procedure for both vehicles sides

- Remove the nut -arrow- and remove bolt toward rear.



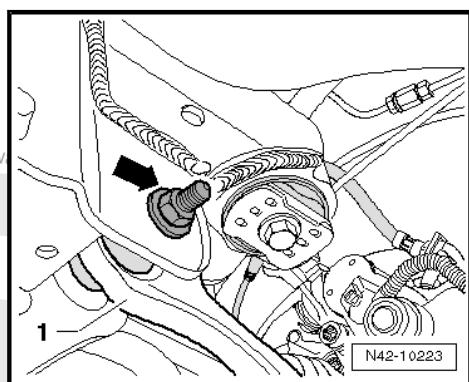
- Remove tie rod -1-.

Installing

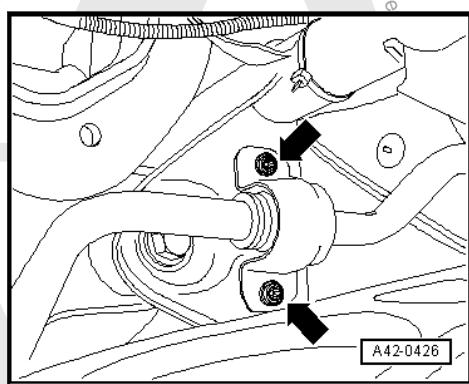
- Insert the tie rod into vehicle and tighten the bolts by hand.

The threaded connections of the tie rod must only be fastened when the dimension "a" is achieved! Refer to **Fig. "Measure dimension -a-", page 209**.

- Fasten the tie rod -1- to the subframe and tighten the new nut -arrow-.



- Tighten bolts -arrows- for stabilizer clamp.



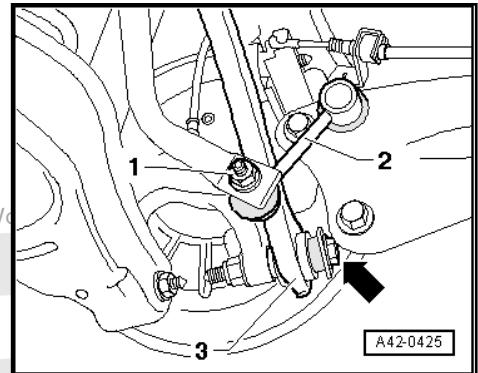
Only for the right vehicle side (depending on equipment)

- Lower the suspension again using Engine/Gearbox Jack -VAS 6931- and remove Engine/Gearbox Jack Adapter -Wheel Hub Support -T10149- from wheel hub.
- Remove the Tensioning Strap -T10038-.



Procedure for both vehicles sides

- Tighten bolt -arrow- for tie rod -3-.



Note

Make sure that washer is installed between nut and wheel bearing housing.

- Insert coupling rod -2- into stabilizer and tighten nut -1-.
- Install the coil spring. Refer to [S12.1 pring, Removing and Installing](#), page 282 .
- Install the wheel and tighten. Refer to [M2 ounting Tightening Specifications](#), page 315 .
- Perform vehicle alignment. Refer to [A8 lignment](#), page 340 .

Tightening Specifications

Component	Tightening Specification
Tie rod to steering knuckle <ul style="list-style-type: none"> ◆ Use a new bolt and nut ◆ Tighten bolts in curb weight position 	130 Nm + 90° additional turn
Tie rod to subframe <ul style="list-style-type: none"> ◆ Use a new bolt and nut 	90 Nm + 90° additional turn
Stabilizer bar to subframe <ul style="list-style-type: none"> ◆ Use new bolts. ◆ Tighten bolts in curb weight position 	25 Nm + 45° additional turn
Stabilizer bar to coupling rod <ul style="list-style-type: none"> ◆ Use a new nut 	45 Nm



11 Overview - Wheel Bearing Housing, Trailing Arm, AWD

- ⇒ [**B11.1 earing Housing, Removing and Installing", page 265**](#)
- ⇒ [**B11.2 earing Housing Bonded Rubber Bushing, Replacing", page 269**](#)
- ⇒ [**B11.3 earing and Wheel Hub, Removing and Installing", page 273**](#)
- ⇒ [**A11.4 rm with Mounting Bracket, Removing and Installing", page 275**](#)
- ⇒ [**A11.5 rm, Servicing", page 279**](#)

The -arrow- points in the direction of travel.





1 - Mounting Bracket

2 - Cover

3 - Bolt

- 90 Nm +90° additional turn
- Always replace if removed

4 - Coupling Rod

- Connects stabilizer bar to trailing arm/wheel bearing housing

5 - Bolt

- 90 Nm + 45° additional turn
- Observe the tightening sequence. Refer to [Fig. "Position: trailing arm/wheel bearing housing threaded connection"](#), page 267.
- Always replace if removed

6 - Trailing Arm

- Removing and Installing. Refer to [A11.4 rm with Mounting Bracket, Removing and Installing](#), page 275.
- Servicing. Refer to [A11.5 rm, Servicing](#), page 279.

7 - Drive Axle

- Overview. Refer to [-14 Drive Axle](#), page 294.
- Removing and Installing. Refer to [A14.3 xle, Removing and Installing](#), page 301.

8 - Internal Multi-Point Bolt

- 70 Nm + 90° additional turn
- Always replace if removed

9 - Wheel Bearing Housing

- Removing and Installing. Refer to [B11.1 earing Housing, Removing and Installing](#), page 265.

10 - Right Rear ABS Wheel Speed Sensor -G44-/Left Rear ABS Wheel Speed Sensor -G46-

- Can be tested in Guided Fault Finding using the Vehicle Diagnostic Tester.
- Before inserting the sensor, clean the inner surface of the hole and coat with Grease -G 000 650-.

11 - Hex Socket Bolt

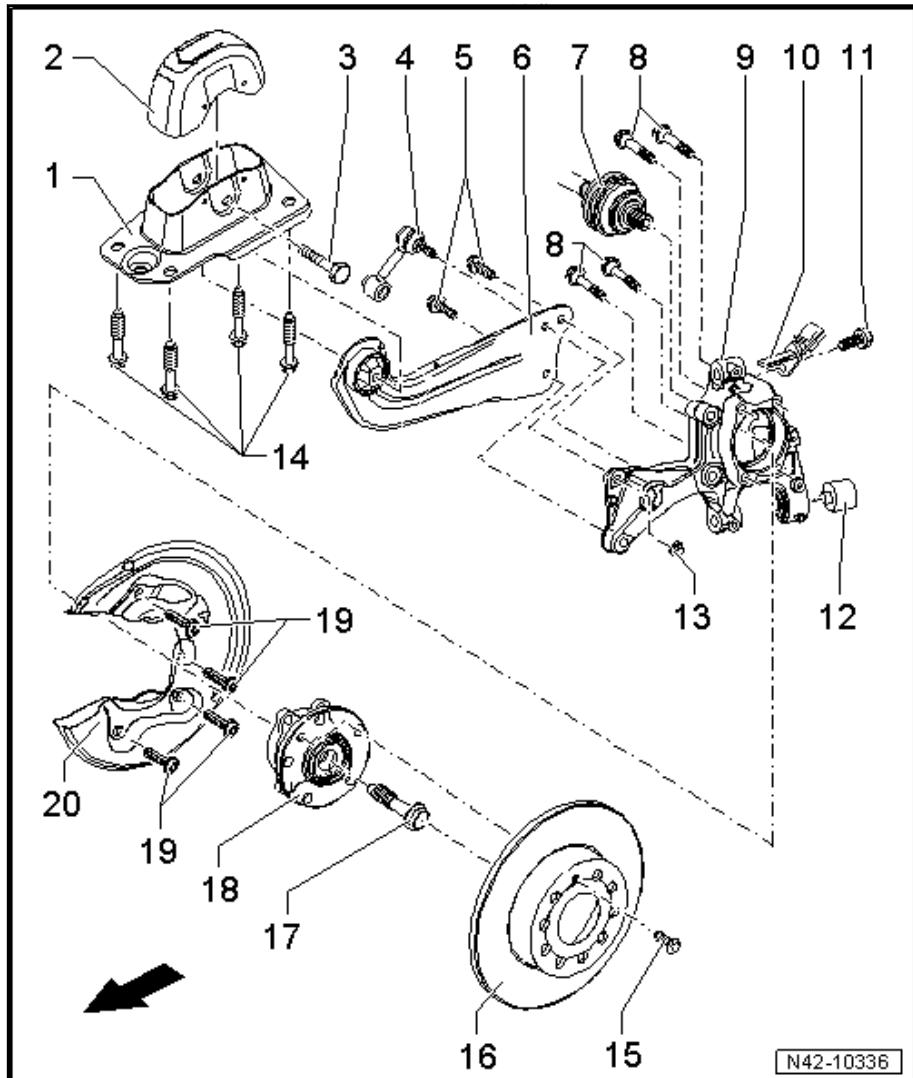
- M6 x 16
- 8 Nm

12 - Bonded Rubber Bushing

- Replacing. Refer to [B11.2 earing Housing Bonded Rubber Bushing, Replacing](#), page 269.

13 - Nut

- 45 Nm
- Self-locking
- Always replace if removed



N42-10336

Validity with respect to the correctness of information in this document



14 - Bolt

- 50 Nm + 45° additional turn
- Always replace if removed

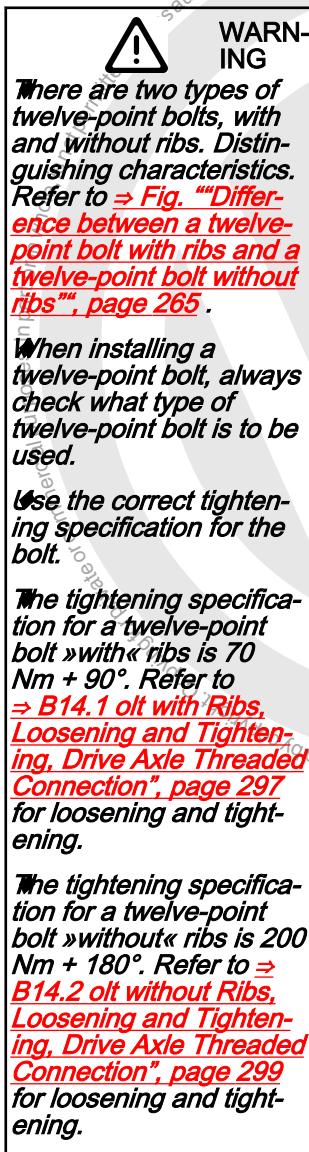
15 - Bolt

- 4 Nm

16 - Brake Rotor

17 - Bolt

- Different versions
- Allocation. Refer to the ⇒ Electronic Parts Catalog (ETKA).



- Always replace if removed

18 - Wheel Hub with Wheel Bearing

- The ABS sensor ring is installed in the wheel bearing
- Removing and Installing. Refer to ⇒ B11.3 earing and Wheel Hub, Removing and Installing", page 273 .

The wheel bearing and wheel hub are installed together in a housing.

This wheel bearing/hub unit is maintenance and adjustment free. Adjusting as well as repair work is not possible!

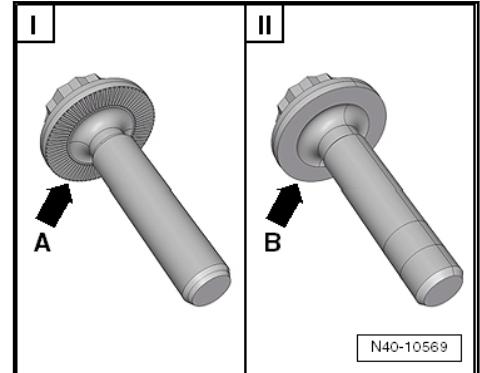


19 - Bolt

- 12 Nm

20 - Cover Plate

Difference between a twelve-point bolt with ribs and a twelve-point bolt without ribs



The contact surfaces -arrow A- and -arrow B- are different on the two-point bolts.

I - Twelve-Point Bolt with Ribs -arrow A-

II - Twelve-Point Bolt without Ribs -arrow B-

11.1 Wheel Bearing Housing, Removing and Installing

Special tools and workshop equipment required

- ◆ Torque Wrench, 40-200Nm -V.A.G 1332A-



Removing

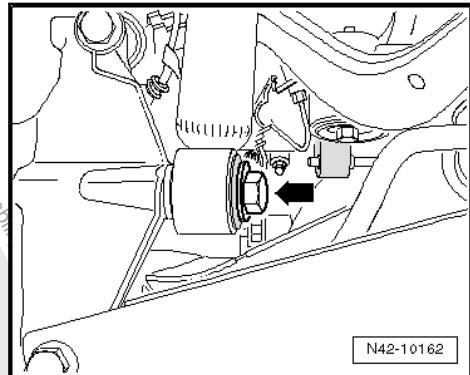
- Remove the coil spring. Refer to [⇒ S12.1 spring, Removing and Installing", page 282](#).
- Loosen the drive axle bolt on the wheel hub:

 - ◆ Twelve-point bolt with ribs. Refer to [⇒ B14.1 bolt with Ribs, Loosening and Tightening, Drive Axle Threaded Connection", page 297](#).
 - ◆ Twelve-point bolt without ribs. Refer to [⇒ B14.2 bolt without Ribs, Loosening and Tightening, Drive Axle Threaded Connection", page 299](#).

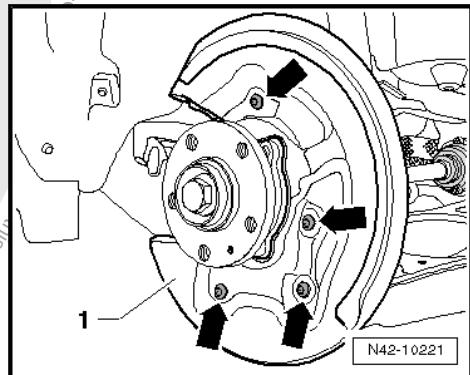
- Remove the wheel.
- Remove the brake carrier and brake caliper and tie to body with wire. Refer to ⇒ Rep. Gr. 46.



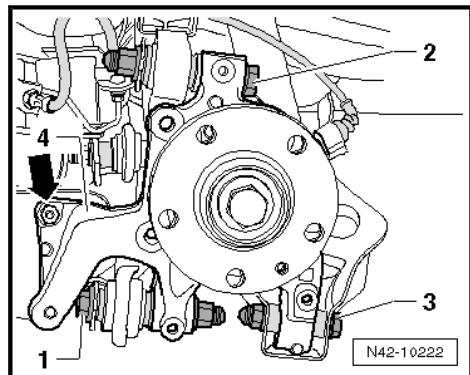
- Remove the ABS speed sensor from the wheel bearing housing.
- Remove the bolt -arrow-.



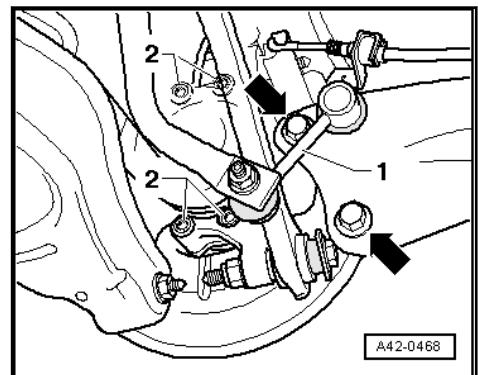
- Remove the bolts -arrows- and cover plate -1-.



- Remove bolt for tie rod -1-, upper transverse link -2- and lower transverse link -3- from wheel bearing housing -4-.



- Remove the coupling rod from the wheel bearing housing -arrow-.
- Pull the coupling rod -1- out of the trailing arm.



- Hold wheel bearing housing tightly and remove the bolts -arrows-.
- Remove the wheel bearing housing.

Installing

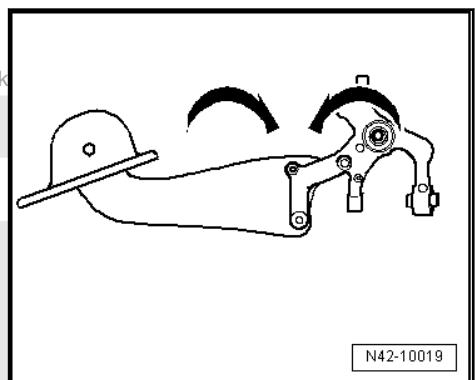
Install in reverse order of removal while noting the following:



Note

Make sure there is a washer between the tie rod, the upper transverse link, the shock absorber and the wheel bearing housing.

Position: trailing arm/wheel bearing housing threaded connection

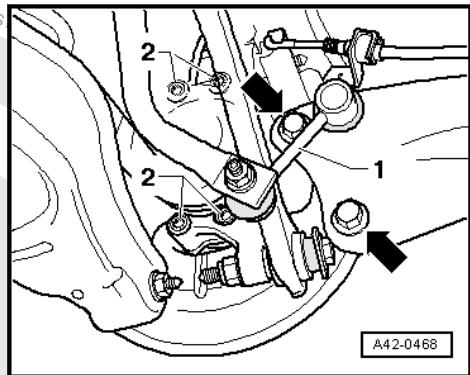


The trailing arm/wheel bearing housing threaded connection must only be tightened when all other components (especially the spring and strut) of the respective wheel suspension have already been assembled. To tighten, suspension must be unloaded. Only now do the trailing arm and wheel bearing housing move into the position required -arrows-.

- Install the coil spring. Refer to [S12.1 Spring, Removing and Installing](#), page 282 .

Always perform the following steps in the sequence given!

- Place the trailing arm on wheel bearing housing with screws -arrows- but do not tighten yet.



- Insert the coupling rod -1- into the trailing arm, but do not tighten the nut yet.
- Lower the suspension again using Engine/Gearbox Jack -VAS 6931- and remove Engine/Gearbox Jack Adapter - Wheel Hub Support -T10149- from wheel hub.
- Tighten the bolts for trailing arm to tightening specification, while observing the required position of components. Refer to ⇒ Fig. “Position: trailing arm/wheel bearing housing threaded connection”, page 267 .
- Connect the coupling rod -1- to the wheel bearing housing and stabilizer bar.

Bolting at wheel bearing housing may occur only when the dimension between wheel hub center and lower edge of wheel house, has been attained Refer to ⇒ Fig. “Measure dimension -a- ”, page 209 .

- Install the brake carrier with brake caliper. Refer to ⇒ Brake Systems; Rep. Gr. 46.
- Tighten the drive axle bolt to wheel hub:
 - ◆ Twelve-point bolt with ribs. Refer to ⇒ [B14.1 olt with Ribs, Loosening and Tightening, Drive Axle Threaded Connection](#), page 297 .
 - ◆ Twelve-point bolt without ribs. Refer to ⇒ [B14.2 olt without Ribs, Loosening and Tightening, Drive Axle Threaded Connection](#), page 299 .



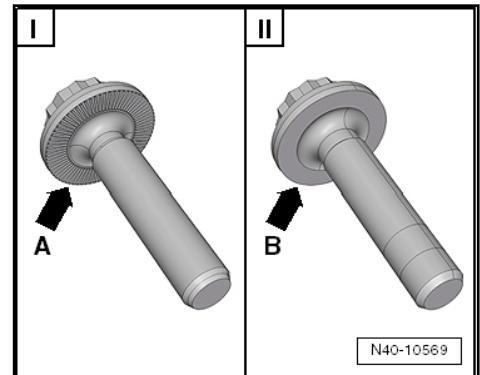
Caution

The vehicle must not be resting on the wheels when doing so.

When the bolt is loose, the wheel bearing can be damaged by the weight of the vehicle.



Difference between a twelve-point bolt with ribs and a twelve-point bolt without ribs



The contact surfaces -arrow A- and -arrow B- are different on the two-point bolts.

I - Twelve-Point Bolt with Ribs -arrow A-

II - Twelve-Point Bolt without Ribs -arrow B-

- Install the wheel and tighten. Refer to [M2 Counting Tightening Specifications](#), page 315 .

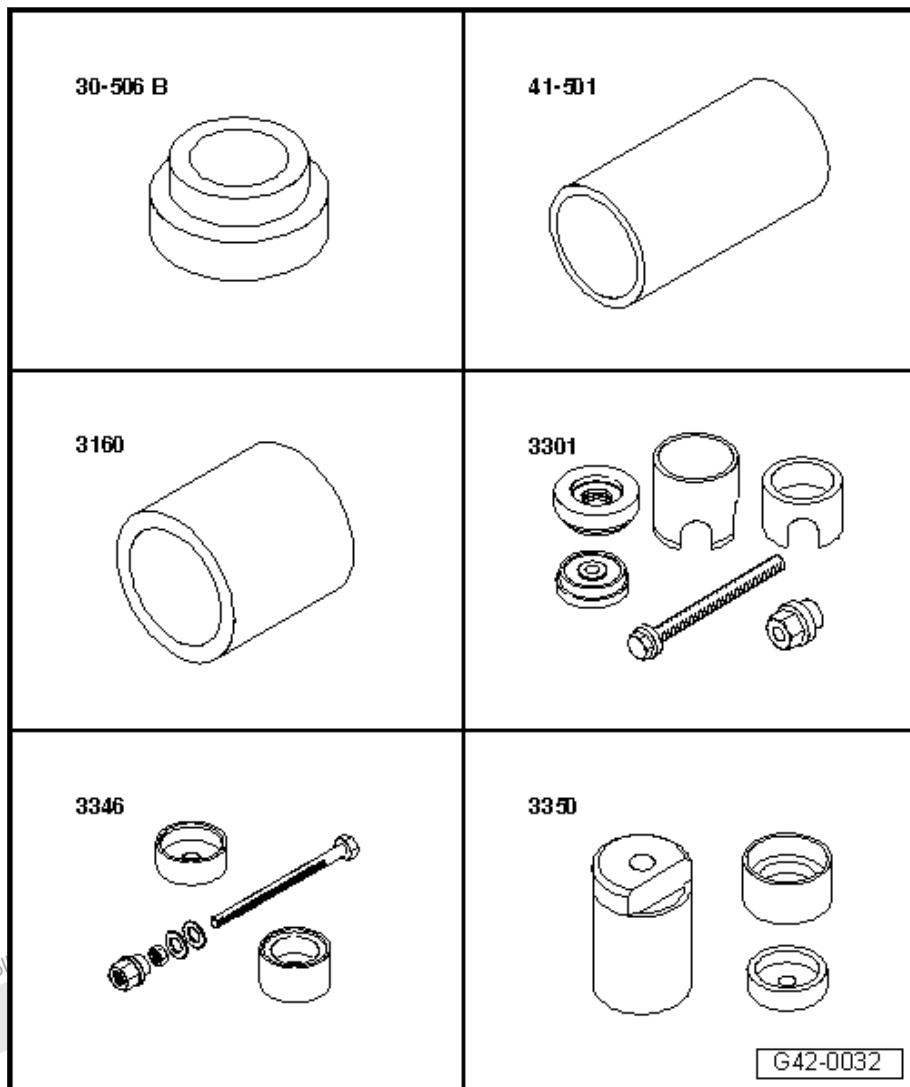
Tightening Specifications

Component	Tightening Specification
Wheel bearing housing to upper transverse link <ul style="list-style-type: none"> ◆ Use a new bolt and nut ◆ Tighten bolts in curb weight position 	130 Nm + 90° additional turn
Wheel bearing housing to lower transverse link <ul style="list-style-type: none"> ◆ Use a new bolt and nut ◆ Tighten bolts in curb weight position 	90 Nm + 90° additional turn
Wheel bearing housing to tie rod <ul style="list-style-type: none"> ◆ Use a new bolt and nut ◆ Tighten bolts in curb weight position 	130 Nm + 90° additional turn
Trailing arm to wheel bearing housing <ul style="list-style-type: none"> ◆ Use new bolts. 	90 Nm + 45° additional turn
Connecting link to wheel bearing housing <ul style="list-style-type: none"> ◆ Use a new nut 	45 Nm
Cover plate to wheel bearing housing	12 Nm
ABS speed sensor to wheel bearing housing	8 Nm
Shock absorber to wheel bearing housing	180 Nm
Brake rotor to wheel bearing housing	4 Nm
Drive axle to wheel hub "twelve-point bolt with ribs" <ul style="list-style-type: none"> ◆ Use a new bolt 	70 Nm + 90°
Drive axle to wheel hub "twelve-point bolt without ribs" <ul style="list-style-type: none"> ◆ Use a new bolt 	200 Nm + 180°

11.2 Wheel Bearing Housing Bonded Rubber Bushing, Replacing



Special tools and workshop equipment required



- ◆ Bearing Installer - Needle Bearing -30 - 506 B-
- ◆ Press Tube -41 - 501-
- ◆ Press Piece - Front Wishbone -3160-
- ◆ Subframe Bushing Tool Kit -3301-
- ◆ Bearing Installer - Control Arm -3346-
- ◆ Bearing Installer - Carrier Bearing -3350-



- ◆ Torque Wrench, 40-200Nm -V.A.G 1332A-

V.A.G 1332



W00-0428

Removing

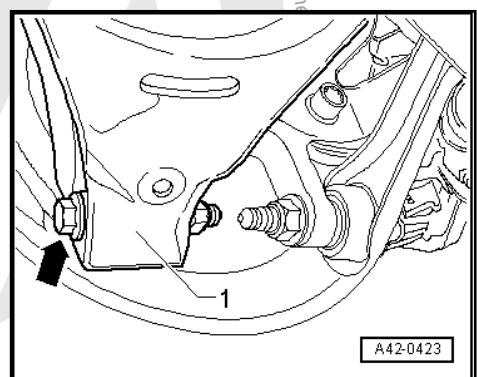
- Remove the wheel.
- Remove the coil spring. Refer to ⇒ [S12.1 Spring, Removing and Installing](#), page 282 .
- Remove the brake carrier and brake caliper and tie to body with wire. Refer to ⇒ Rep. Gr. 46.



Note

Suspend the brake caliper from body.

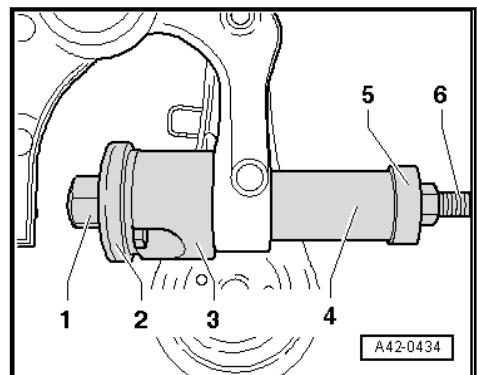
- Remove the Phillips head screw for the brake rotor and then remove the brake rotor.
- Remove the cover plate.
- Remove the bolt-arrow- for the lower transverse link -1-.



A42-0423

Pressing out the bonded rubber bushing

- Attach tools as depicted in illustration.



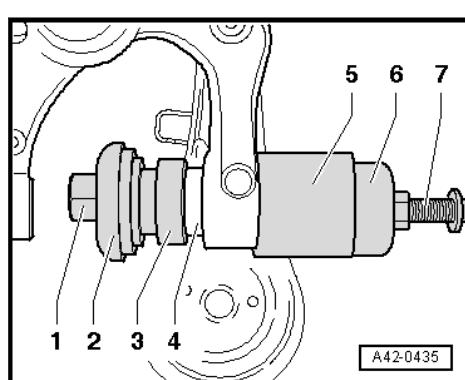
A42-0434



- 1 - Control Arm Bearing Installer - Nut - 3346/3-
- 2 - Subframe Bushing Tool Kit - 3301-
- 3 - Subframe Bushing Tool Kit - Assembly Tool 3 - 3301/3-
- 4 - Press Tube - 41-501-
- 5 - 3350/1-
- 6 - Bearing Installer - Component - 3346/2-
- Remove bonded rubber bushing by turning the spindle.

Bonded Rubber Bushing, Installing

- Attach tools as depicted in illustration.



- 1 - Control Arm Bearing Installer - Nut - 3346/3-
- 2 - Subframe Bushing Tool Kit - 3301-
- 3 - 30-506 B-
- 4 - Bonded Rubber Bushing
- 5 - Press Piece - Front Wishbone - 3160-
- 6 - Bearing Installer - Carrier Bearing - 3350/2-
- 7 - Bearing Installer - Component - 3346/2-

Install the bonded rubber bushing by turning support arm bearing installation tool.



- ◆ Do not use lubricant!
- ◆ Insert the bearing with care so it is not tilted.

Installing

Install in reverse order of removal while noting the following:

Bolting at wheel bearing housing may only occur when the dimension between wheel hub center and lower edge of wheel housing, measured before assembly, is achieved. Refer to ⇒ Fig. "Measure dimension -a-", page 209 .

Tightening Specifications

Component	Tightening Specification
Wheel bearing housing to lower transverse link <ul style="list-style-type: none">◆ Use a new bolt and nut◆ Tighten bolts in curb weight position	90 Nm + 90°



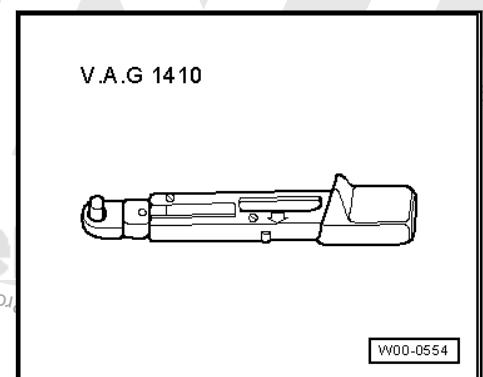
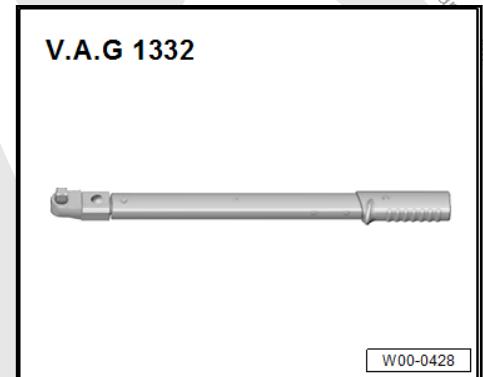
Component	Tightening Specification
Cover plate to wheel bearing housing	10 Nm
Brake rotor to wheel bearing housing	4 Nm

11.3 Wheel Bearing and Wheel Hub, Removing and Installing

Special tools and workshop equipment required

- ◆ Torque Wrench, 40-200Nm -V.A.G 1332A-

- ◆ Torque Wrench -V.A.G 1410-



Removing

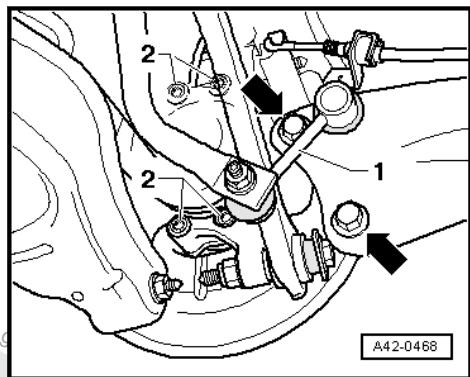
- Remove the coil spring. Refer to ⇒ [S12.1 spring, Removing and Installing](#), page 282 .
- Remove the drive axle. Refer to ⇒ [A14.3 axle, Removing and Installing](#), page 301 .
- Remove the brake carrier and brake caliper and tie to body with wire. Refer to ⇒ Rep. Gr. 46.



Note

Do not allow brake caliper to hang from brake line.

- Remove the brake rotor bolt and the brake rotor.
- Remove the bolts -2-.



- Remove wheel hub/wheel bearing unit from wheel bearing housing.

Installing

Install in reverse order of removal while noting the following:

- Tighten the drive axle bolt to wheel hub:
- ◆ Twelve-point bolt with ribs. Refer to [⇒ B14.1 olt with Ribs, Loosening and Tightening, Drive Axle Threaded Connection](#), page 297 .
- ◆ Twelve-point bolt without ribs. Refer to [⇒ B14.2 olt without Ribs, Loosening and Tightening, Drive Axle Threaded Connection](#), page 299 .

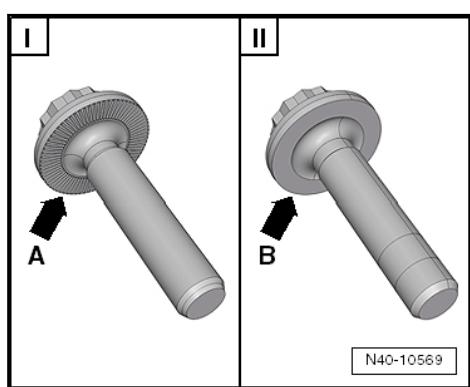


Caution

The vehicle must not be resting on the wheels when doing so.

When the bolt is loose, the wheel bearing can be damaged by the weight of the vehicle.

Difference between a twelve-point bolt with ribs and a twelve-point bolt without ribs



The contact surfaces -arrow A- and -arrow B- are different on the two-point bolts.

I - Twelve-Point Bolt with Ribs -arrow A-

II - Twelve-Point Bolt without Ribs -arrow B-



Tightening Specifications

Component	Tightening Specification
Wheel hub with wheel bearing to wheel bearing housing ◆ Use a new bolt	70 Nm + 90° additional turn
Brake rotor to wheel bearing housing	4 Nm

11.4 Trailing Arm with Mounting Bracket, Removing and Installing

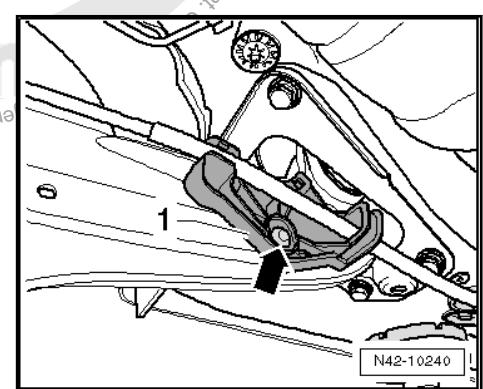
Special tools and workshop equipment required

- ◆ Torque Wrench, 40-200Nm -V.A.G 1332A-

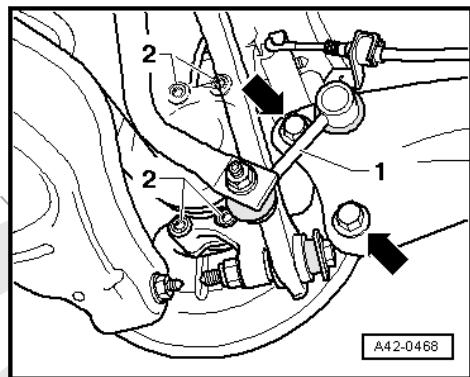


Removing

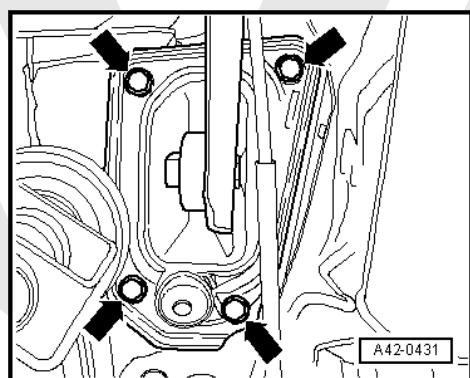
- Remove the wheel.
- Remove the coil spring. Refer to [S12.1 Spring, Removing and Installing](#), page 282.
- Remove the bracket -1- by pressing out rivet inner pin -arrow-.



- Remove the coupling rod -1- from trailing arm.



- Remove the bolts -arrows-.
- Mark installation position of mounting bracket on body.
- Remove the bolts -arrows-.

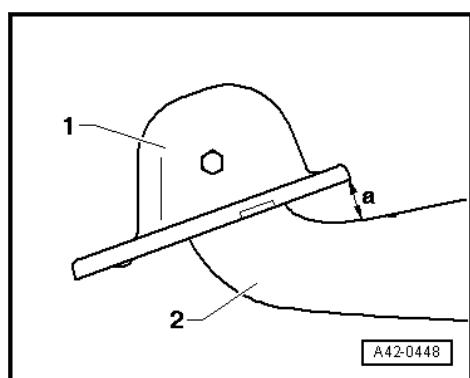


- Remove the trailing arm with mounting bracket.

If longitudinal control arm is being replaced, mounting bracket must be removed from longitudinal control arm.

Installation position of mounting bracket to trailing arm must then be adjusted.

Determining the installation position of mounting bracket relative to the trailing arm



Dimension -a- is 34 mm.

1 - Mounting Bracket

2 - Trailing Arm

- When dimension -a- has been adjusted, tighten bolt.

Installing

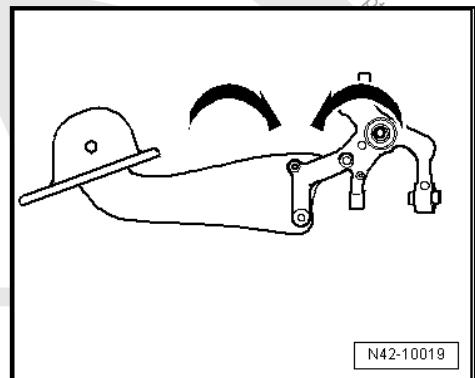
Install in reverse order of removal while noting the following:



The trailing arm/wheel bearing housing threaded connection must only be tightened when all other components (especially the spring and strut) of the respective wheel suspension have already been assembled. To tighten, suspension must be unloaded. Only now do the trailing arm and wheel bearing housing move into the position required -arrows-.

- Install the coil spring. Refer to [S5.1 Spring, Removing and Installing](#), page 192 .

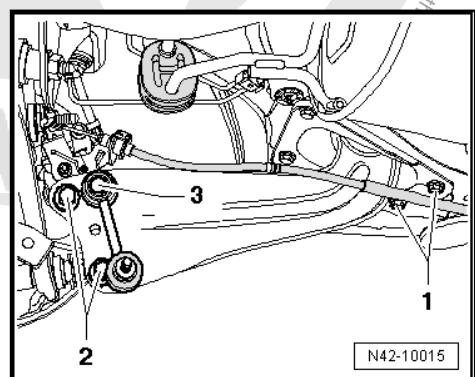
Position: trailing arm/wheel bearing housing threaded connection



N42-10019

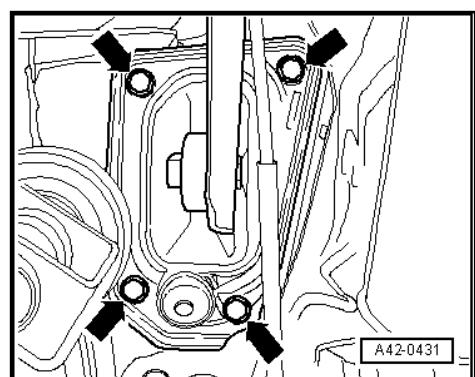
Always perform the following steps in the sequence given!

- Install the trailing arm and mounting bracket with bolts -2- on wheel bearing housing but do not yet tighten.



N42-10015

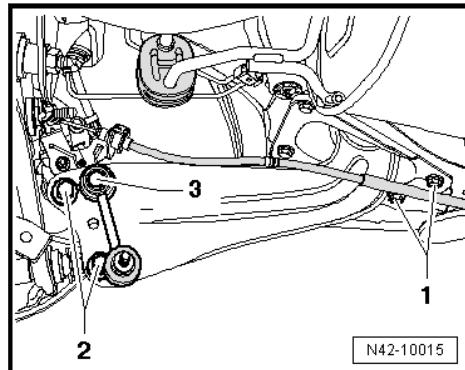
- Insert the coupling rod -3- into the trailing arm, do not tighten nut yet.
- Raise the suspension using Engine and Gearbox Jack -VAS 6931- and Engine/Gearbox Jack Adapter - Wheel Hub Support -T10149-, until the mounting bracket contacts the body.
- Tighten the bolts -arrows- on the old impression.



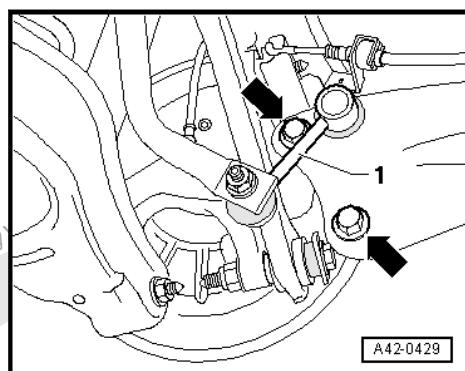
A42-0431



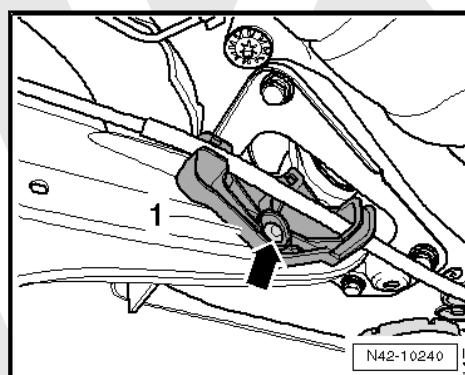
- Lower the suspension again using Engine/Gearbox Jack -VAS 6931- and remove Engine/Gearbox Jack Adapter - Wheel Hub Support -T10149- from wheel hub.
- Tighten the trailing arm bolts -2- to the tightening specification while making sure the components are in their necessary positions. Refer to [Fig. “Position: trailing arm/wheel bearing housing threaded connection”](#), page 277 .



- Connect the coupling rod -1- to the wheel bearing housing and stabilizer bar.



- Install bracket -1- by pressing in new rivet inner pin -arrow-.



After installation, the toe adjustment must be checked on an alignment rack.

- Perform vehicle alignment. Refer to [A8 alignment](#), page 340 .

Tightening Specifications

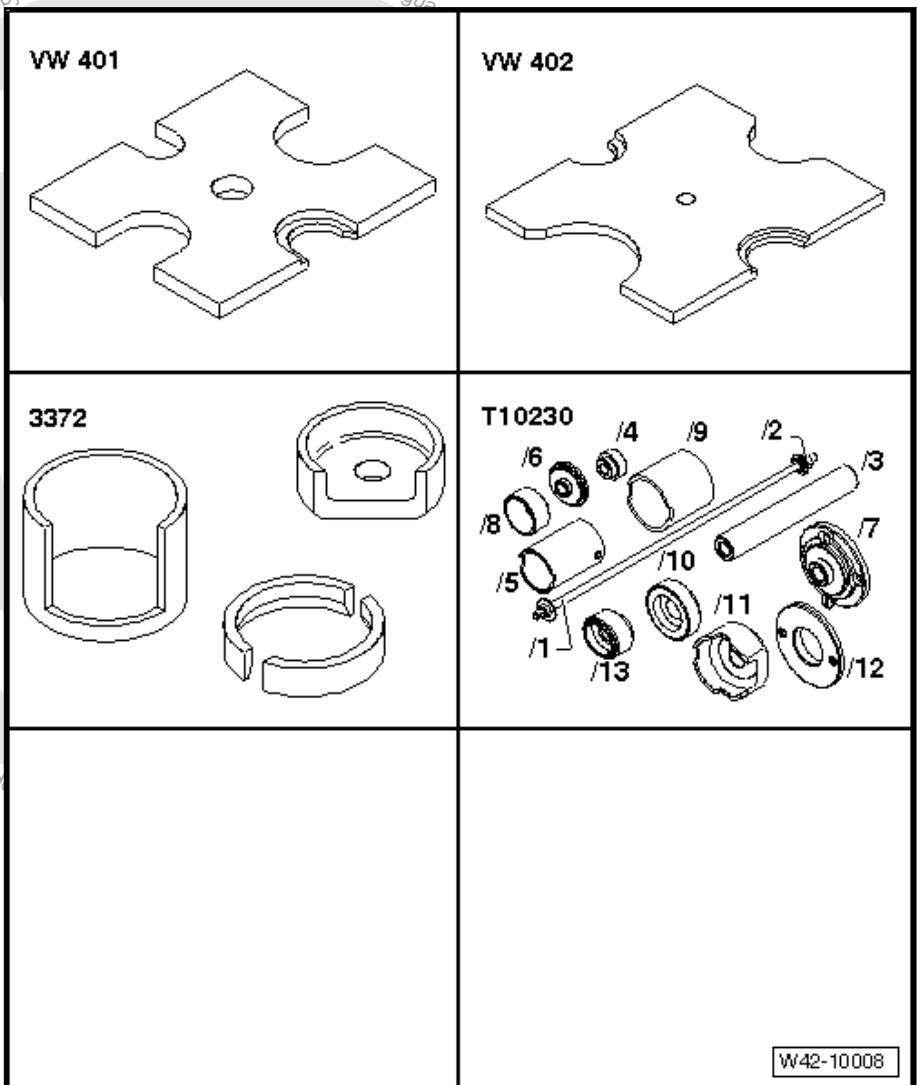
Component	Tightening Specification
Trailing arm to wheel bearing housing ◆ Use new bolts.	90 Nm + 90°



Component	Tightening Specification
Trailing arm to mounting bracket ◆ Use a new bolt	90 Nm + 90°
Mounting bracket to body ◆ Use new bolts.	50 Nm + 45°
Coupling rod to trailing arm ◆ Use a new nut	45 Nm
Parking brake cable to trailing arm. Refer to ⇒ Brake Systems; Rep. Gr. 46.	

11.5 Trailing Arm, Servicing

Special tools and workshop equipment required

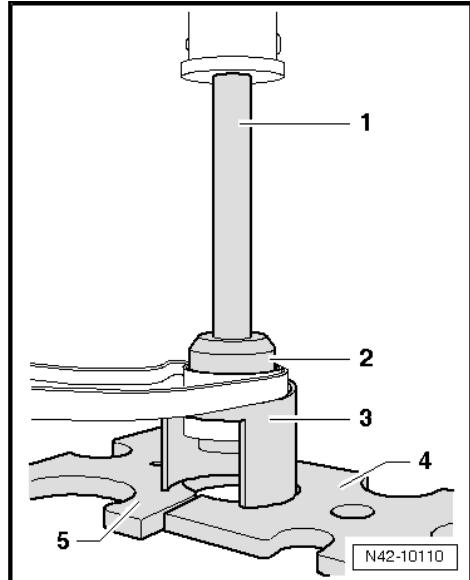


- ◆ Hydraulic Press - Bushing Assembly Tool Kit -T10230-
- ◆ Front Subframe Mount Kit -3372-
- ◆ Press Plate -VW 401-
- ◆ Press Plate -VW 402-



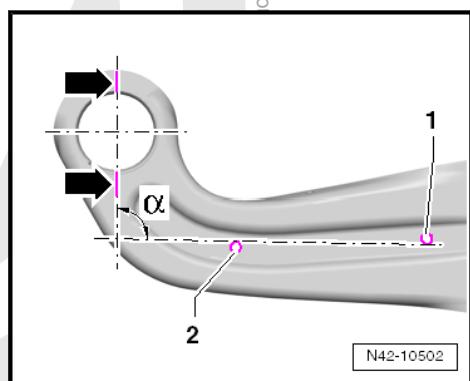
Bonded Rubber Bushing, Pressing Out

- Remove the trailing arm. Refer to [A11.4 rm with Mounting Bracket, Removing and Installing](#), page 275.
- Install the tools as shown.



- 1 - Hydraulic Press - Bushing Assembly Tool Kit - Pipe - T10230/3-
- 2 - Hydraulic Press - Bushing Assembly Tool Kit - Press Piece -T10230/10-
- 3 - Front Subframe Mount Kit -3372-
- 4 - Press Plate -VW 401-
- 5 - Press Plate-VW 402-
- Press out the bonded rubber bushing.

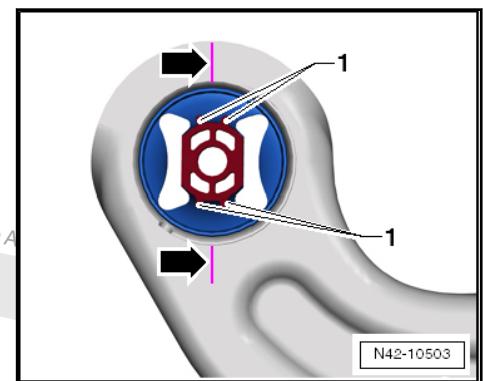
Bonded Rubber Bushing, Pressing In



- Mark the position of the bonded rubber bushing on the trailing arm with a right angle.
- Place the outer edge of the right angle on the lower -1- and upper radius -2- of the hole.
- Make a mark over and under the bushing on the trailing arm -arrows-.

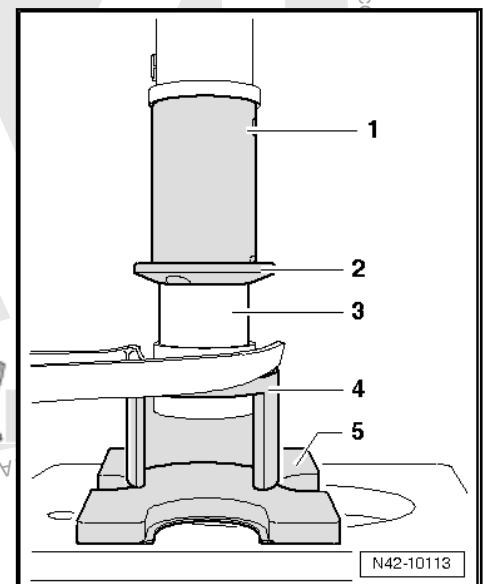
$\alpha = 90^\circ$

Position the bonded rubber bushing on the trailing arm so that the marked line -arrows- is between the raised sections -1-.



Note
Make absolutely sure that the bonded rubber bushing is in the correct installation position in relation to the trailing arm socket.

- Install the tools as shown.



- 1 - Hydraulic Press - Bushing Assembly Tool Kit - Tube - T10230/5-
- 2 - Hydraulic Press - Bushing Assembly Tool Kit-Thrust Plate -T10230/12-, the chamfer must face the bonded rubber bushing
- 3 - Bonded Rubber Bushing
- 4 - Front Subframe Mount Kit -3372-
- 5 - Press Plate -VW 402-

- Press in bonded rubber bushing flush.
- Install the mounting bracket on trailing arm. Refer to [Fig. “Determining the installation position of mounting bracket relative to the trailing arm”](#), page 276 .
- Install the trailing arm. Refer to [A11.4 rm with Mounting Bracket, Removing and Installing](#), page 275 .



12 Overview - Shock Absorber, Coil Spring, AWD

- ⇒ [S12.1 Spring, Removing and Installing", page 282](#)
- ⇒ [A12.2 Absorber, Removing and Installing", page 285](#)
- ⇒ [A12.3 Absorber, Servicing", page 286](#)

1 - Lower Spring Support

- Spring end rotated up to stop

2 - Assembly Aid

- Must not be used after removal

3 - Coil Spring

- There are different suspension versions. Refer to ⇒ [D8.11 ata Label", page 353](#) for the vehicle data plate.
- Removing and Installing. Refer to ⇒ [S12.1 Spring, Removing and Installing", page 282](#).

4 - Upper Spring Support

5 - Bolt

- 180 Nm

6 - Bolt

- 50 Nm + 45° additional turn
- Always replace if removed

7 - Shock Absorber

- Removing and Installing. Refer to ⇒ [A12.2 Absorber, Removing and Installing", page 285](#).
- Servicing. Refer to ⇒ [A12.3 Absorber, Servicing", page 286](#).
- There are different suspension versions. Refer to ⇒ [D8.11 ata Label", page 353](#) for the vehicle data plate.

8 - Washer

9 - Lower Transverse Link

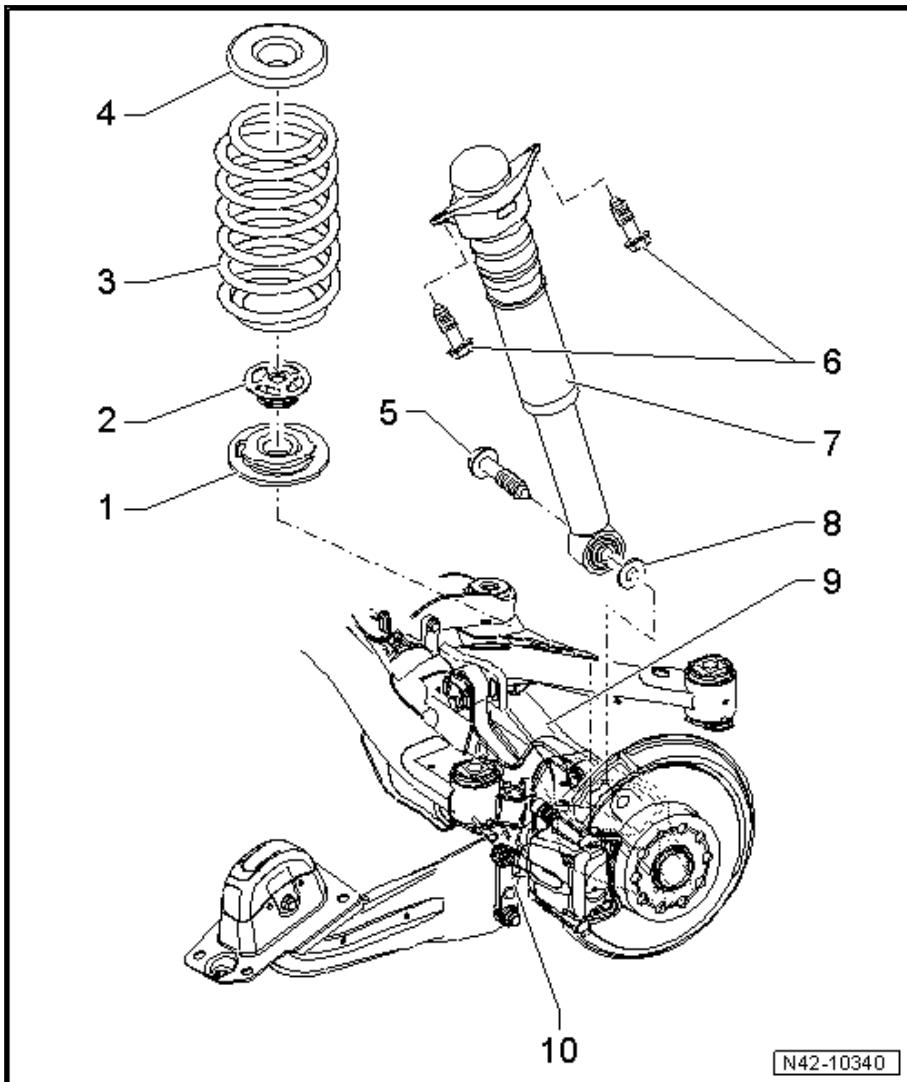
- Removing and Installing. Refer to ⇒ [T10.4 Transverse Link, Removing and Installing", page 255](#).

10 - Wheel Bearing Housing

- Removing and Installing. Refer to ⇒ [B11.1 Bearing Housing, Removing and Installing", page 265](#).

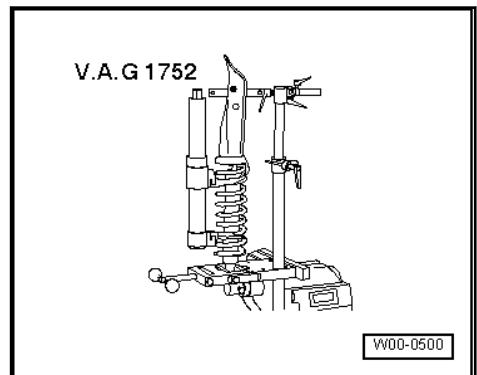
12.1 Coil Spring, Removing and Installing

Special tools and workshop equipment required

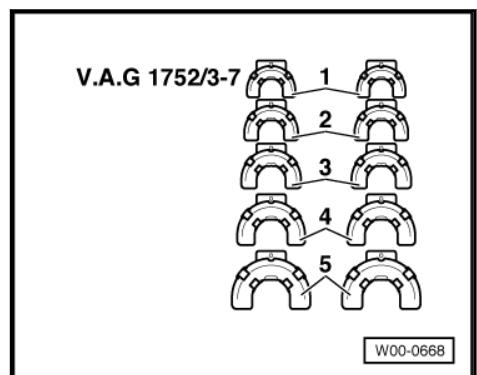




◆ Spring Compressor Kit -V.A.G 1752-



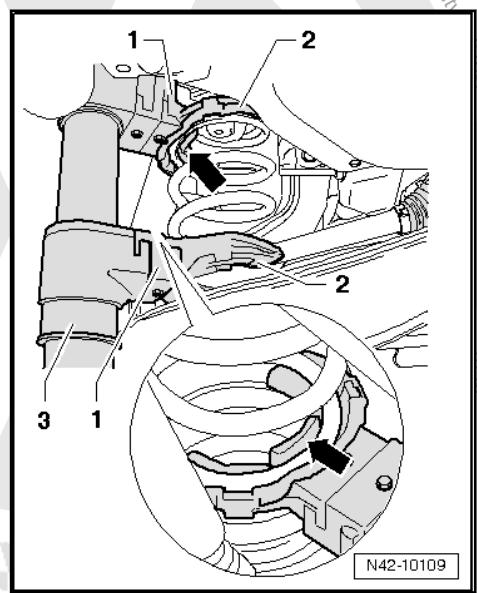
◆ Spring Compressor Kit - Spring Retainer with Inserts -V.A.G 1752/3A-



◆ Spring Compressor Kit - Adapter Blocks -V.A.G 1752/9-, not illustrated

Removing

- Remove the wheel.
- Insert spring compressor -3-.





WARNING

Make sure the coil spring is seated correctly in the Spring Compressor Kit - Spring Retainer with Inserts Spring Compressor Kit - Spring Retainer w/Inserts -V.A.G 1752/3A-. There is a risk of accident if it is not.

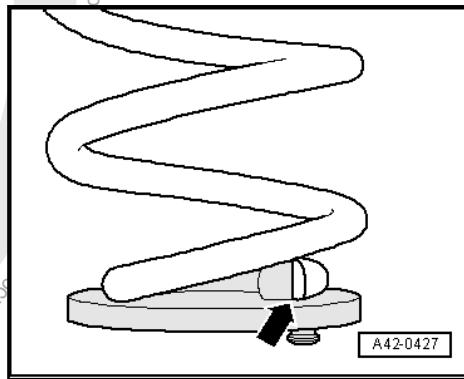
- Use a wrench or a reversible ratchet to tighten spring compressor.
- Tension the coil spring far enough until it can be removed.
- Remove the spring.

- 1 - Spring Compressor Kit - Adapter Blocks -V.A.G 1752/9-
- 2 - Spring Compressor Kit - Spring Retainer w/Inserts - V.A.G 1752/3A-
- 3 - Spring Compressor Kit - Spring Tensioner -V.A.G 1752/1-

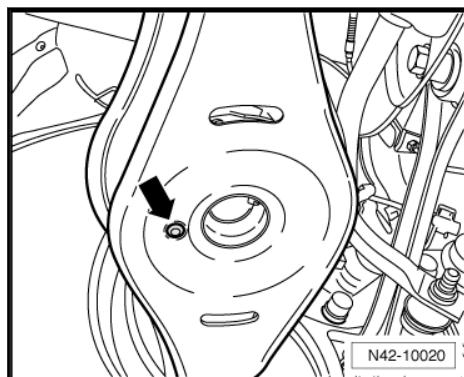
Installing

Install in reverse order of removal while noting the following:

The spring start -arrow- must touch the stop of lower spring support.



- Insert the spring together with the spring support.
- The lower spring support has a pin.
- These pins are inserted into the hole in the lower transverse link -arrows-.



- Then insert spring seat at top into upper spring end.
- Release the spring tension. At the same time, place the upper spring support on the body tab.



- Install the wheel and tighten. Refer to [⇒ M2 Counting Tightening Specifications](#), page 315 .

12.2 Shock Absorber, Removing and Installing

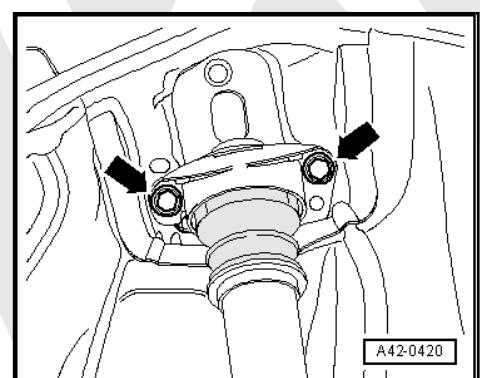
Special tools and workshop equipment required

- ◆ Torque Wrench, 40-200Nm -V.A.G 1332A-

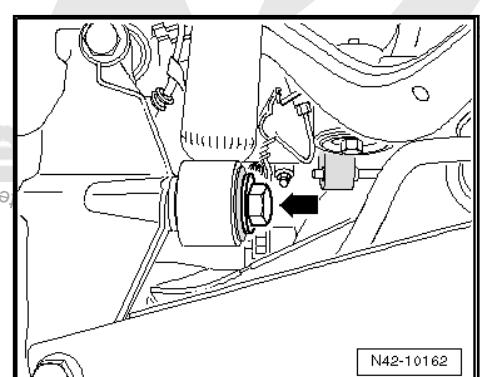


Removing

- Remove the wheel.
- Remove the wheel housing liner. Refer to [⇒ Body Exterior; Rep. Gr. 66](#).
- Remove the coil spring. Refer to [⇒ S12.1 Spring, Removing and Installing](#), page 282 .
- Remove the bolts -arrows-.



- Remove the bolt -arrow-.



- Remove the shock absorber.

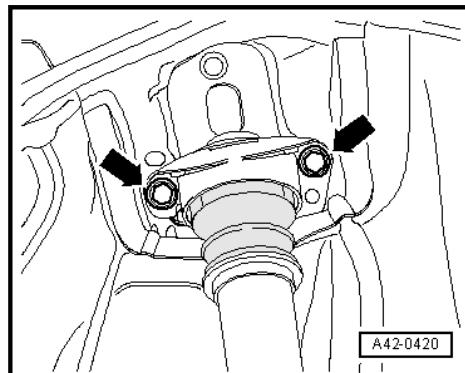


Installing

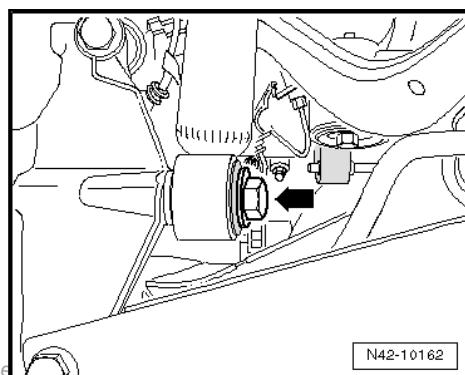
Install in reverse order of removal. Note the following:

Only bolt the shock absorber to the wheel bearing housing when the dimension "a" is reached. Refer to [Fig. "Measure dimension -a- "", page 209](#).

- Insert shock absorber and tighten bolts -arrows-



- Tighten the bolt -arrow-.



Note
Make sure the washer between the wheel bearing housing and shock absorber is also installed.

- Install the coil spring. Refer to [S12.1 Spring, Removing and Installing](#), page 282 .
- Install the wheel housing liner. Refer to [Body Exterior; Rep. Gr. 66](#).
- Install the wheel and tighten. Refer to [M2 Counting Tightening Specifications](#), page 315 .

Tightening Specifications

Component	Tightening Specification
Shock absorber to body ◆ Use new bolts.	50 Nm + 45° additional turn
Shock absorber to wheel bearing housing	180 Nm

12.3 Shock Absorber, Servicing

Special tools and workshop equipment required



- ◆ Torque Wrench, 40-200Nm -V.A.G 1332A-

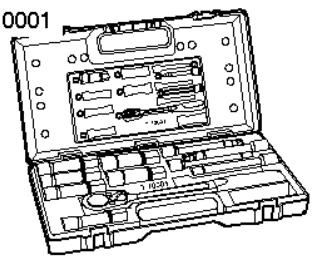
V.A.G 1332



W00-0428

- ◆ Shock Absorber Set -T10001-

T 10001



W00-0497



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1 - Shock Absorber

- Removing and Installing. Refer to [A12.2 bsorber, Removing and Installing](#), page 285.
- There are different suspension versions. Refer to [D8.11 ata Label](#), page 353 for the vehicle data plate.

2 - Protective Cap

3 - Protective Pipe

4 - Support Ring

- Allocation. Refer to the [Electronic Parts Catalog \(ETKA\)](#).

5 - Stop Buffer

- For shock absorber with supporting ring [Item 4 \(page 288\)](#)
- Allocation. Refer to the [Electronic Parts Catalog \(ETKA\)](#).

6 - Shock Absorber Mount

- For shock absorber with supporting ring [Item 4 \(page 197\)](#)
- Allocation. Refer to the [Electronic Parts Catalog \(ETKA\)](#).

7 - Nut

- 25 Nm
- Always replace if removed
- Loosening and tightening. Refer to [Fig. "Shock Absorber Mount Threaded Connection, Loosening and Tightening"](#), page 288

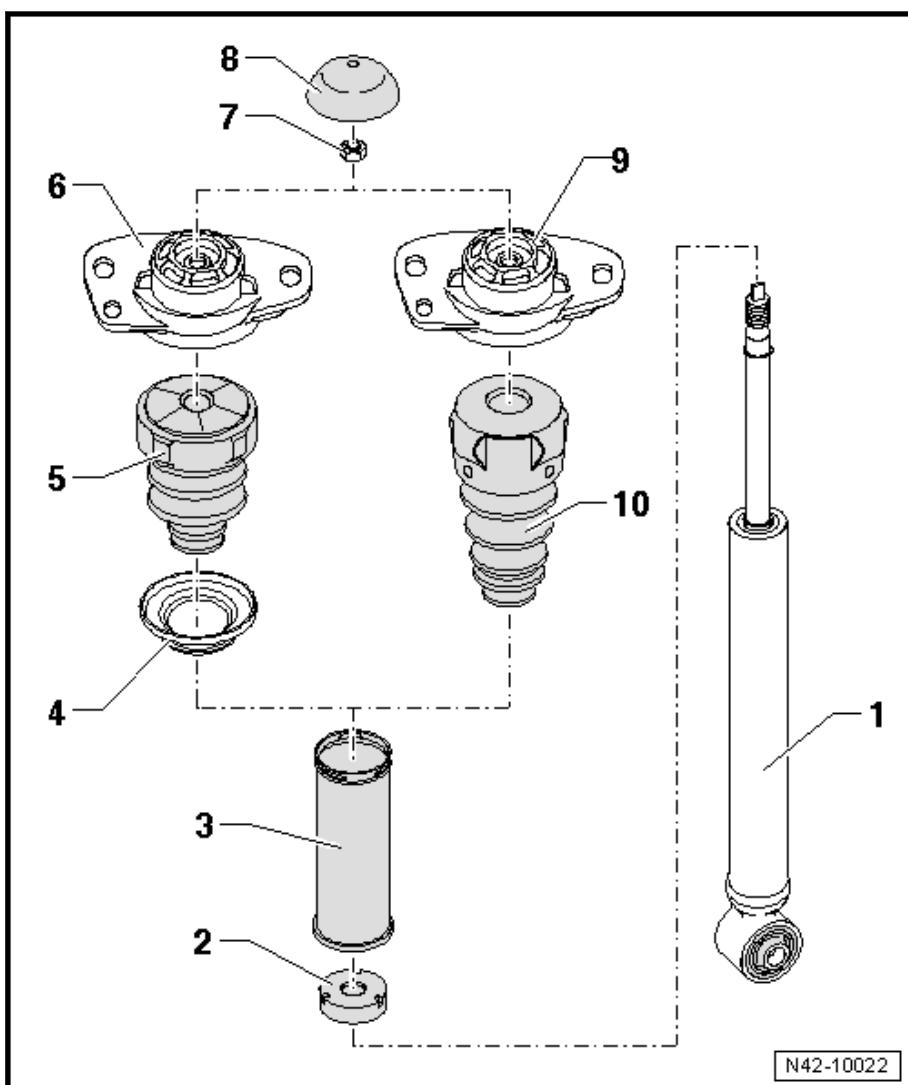
8 - Cover

9 - Shock Absorber Mount

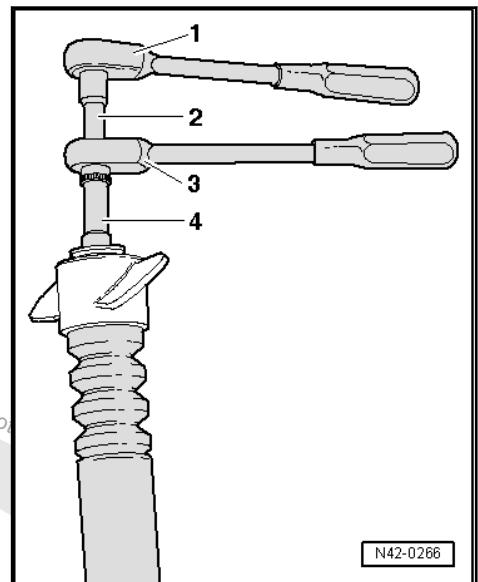
- For shock absorber without supporting ring [Item 4 \(page 197\)](#)
- Allocation. Refer to the [Electronic Parts Catalog \(ETKA\)](#).

10 - Stop Buffer

- For shock absorber without supporting ring [Item 4 \(page 197\)](#)
- Allocation. Refer to the [Electronic Parts Catalog \(ETKA\)](#).



Shock Absorber Mount Threaded Connection, Loosening and Tightening



- 1 - Commercially Available Ratchet
- 2 - Shock Absorber Set - Extension with Counter Holder 1
-T10001/9-
- 3 - Shock Absorber Set - Reversible Ratchet -T10001/11-
- 4 - Shock Absorber Set - Socket -T10001/1-

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13 Overview - Stabilizer Bar, AWD

⇒ [B13.1 ar, Removing and Installing", page 290](#)

The -arrow- points in the direction of travel.

1 - Stabilizer Bar

- There are different suspension versions. Refer to ⇒ [D8.11 ata Label", page 353](#) for the vehicle data plate.
- Removing and Installing. Refer to ⇒ [B13.1 ar, Removing and Installing", page 290](#).

2 - Bearings

- Replace bearings always on both sides of vehicle

3 - Clamp

4 - Internal Multi-Point Bolt

- 25 Nm + 45° additional turn
- Always replace if removed

5 - Wheel Bearing Housing

6 - Nut

- 45 Nm
- Self-locking
- Always replace if removed

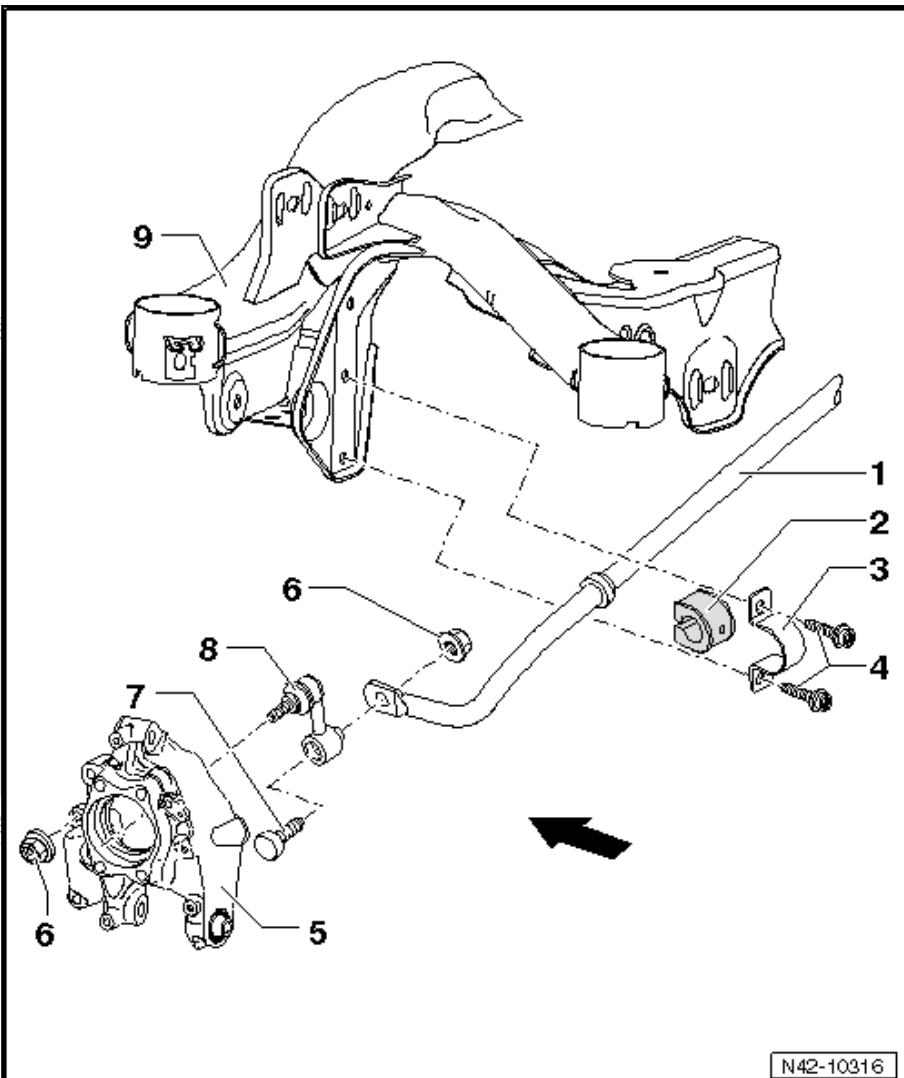
7 - Internal Multi-Point Bolt

- Always replace if removed

8 - Coupling Rod

- Connects stabilizer bar to trailing arm/wheel bearing housing

9 - Subframe



13.1 Stabilizer Bar, Removing and Installing

Special tools and workshop equipment required



- ◆ Torque Wrench, 6-50Nm -VAG 1331A-

V.A.G 1331



W00-0427

Removing

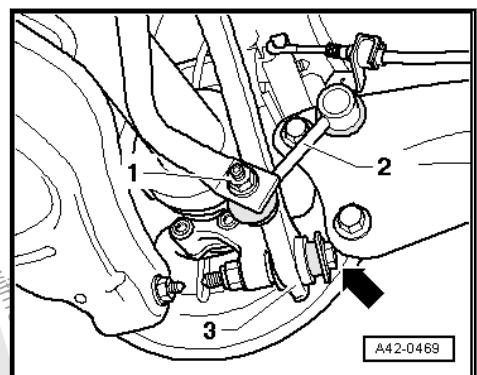
- Remove the rear wheels.



Note

The following work steps are described for the left side of the vehicle. These work steps also apply At the same time for right side of vehicle.

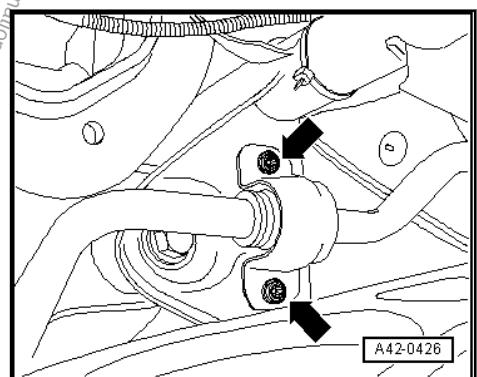
- Remove the nut -1- and pull the coupling rod -2- out of the stabilizer bar.



Note

Do not loosen bolt -arrow- for tie rod -3-.

- Remove the bolts -arrows- for the stabilizer bar clamp.

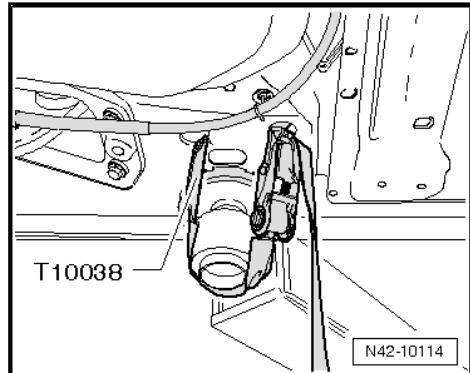




If the upper bolts on the stabilizer bar clamp on the right side of the vehicle cannot be removed, then the following work steps must be performed [⇒ page 292](#).

Only for the right vehicle side (depending on equipment)

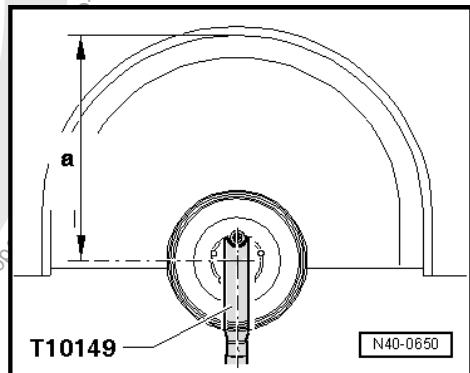
- Now secure the vehicle on both sides to the hoist lifting arms with Tensioning Strap -T10038-.



WARNING

If vehicle is not secured, it could slide off of hoist.

Install the Engine/Gearbox Jack Adapter - Wheel Hub Support -T10149- with wheel bolt on wheel hub.



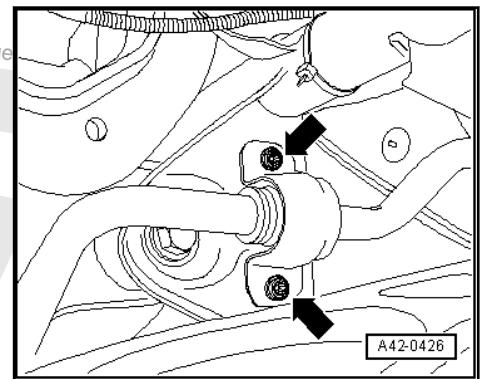
- Lift the wheel hub using the Engine/Gearbox Jack Adapter - Wheel Hub Support -T10149- and Engine and Gearbox Jack -VAS 6931- far enough until it is possible to access the bolts on the right stabilizer bar clamp.

Procedure for both vehicles sides

- Remove the stabilizer bar.

Installing

- Insert stabilizer into vehicle.
- Tighten the bolts -arrows- for stabilizer clamp uniformly.

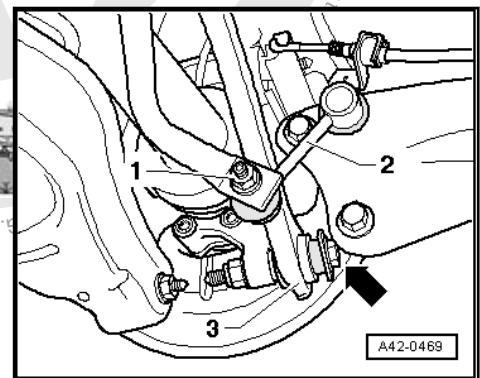


Only for the right vehicle side (depending on equipment)

- Lower the suspension again using Engine/Gearbox Jack -VAS 6931- and remove Engine/Gearbox Jack Adapter -Wheel Hub Support -T10149- from wheel hub.
- Remove the Tensioning Strap -T10038-.

Procedure for both vehicles sides

- Install the coupling rod -2- in the stabilizer bar and tighten the nut -1-.



- Install the wheel and tighten. Refer to [M2 Counting Tightening Specifications](#), page 315 .

Tightening Specifications

Component	Tightening Specification
Stabilizer bar to subframe <ul style="list-style-type: none"> ◆ Use new bolts. ◆ Tighten bolts in curb weight position 	25 Nm + 45° additional turn
Stabilizer bar to coupling rod <ul style="list-style-type: none"> ◆ Use a new nut 	45 Nm



14 Overview - Drive Axle

- ⇒ [B14.1 bolt with Ribs, Loosening and Tightening, Drive Axle Threaded Connection", page 297](#)
- ⇒ [B14.2 bolt without Ribs, Loosening and Tightening, Drive Axle Threaded Connection", page 299](#)
- ⇒ [A14.3 axle, Removing and Installing", page 301](#)
- ⇒ [A14.4 axle, Disassembling and Assembling", page 304](#)
- ⇒ [C14.5 V Joint, Checking", page 309](#)
- ⇒ [C14.6 V Joint, Checking", page 311](#)



1 - Outer CV Joint

- Only replace completely
- Removing. Refer to [Fig. "....., page 306](#).
- Installing: using a plastic hammer, drive onto the shaft all the way

2 - Bolt

- Different versions
- Allocation. Refer to the [Electronic Parts Catalog \(ETKA\)](#).

WARNING
There are two types of twelve-point bolts, with and without ribs. Distinguishing characteristics. Refer to [Fig. "Difference between a twelve-point bolt with ribs and a twelve-point bolt without ribs", page 296](#).

When installing a twelve-point bolt, always check what type of twelve-point bolt is to be used.

Use the correct tightening specification for the bolt.

The tightening specification for a twelve-point bolt »with« ribs is 70 Nm + 90°. Refer to [B14.1 bolt with Ribs, Loosening and Tightening, Drive Axle Threaded Connection", page 297](#) for loosening and tightening.

The tightening specification for a twelve-point bolt »without« ribs is 200 Nm + 180°. Refer to [B14.2 bolt without Ribs, Loosening and Tightening, Drive Axle Threaded Connection", page 299](#) for loosening and tightening.

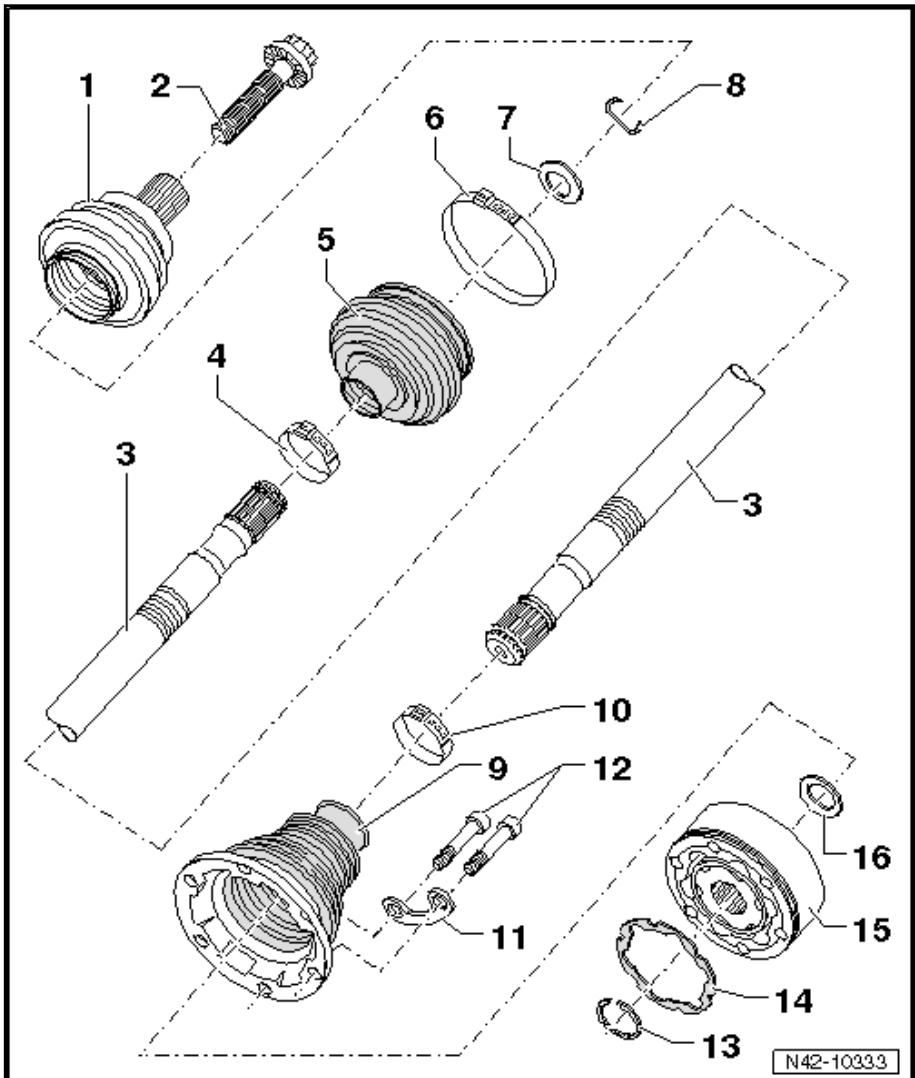
- Always replace if removed

3 - Drive Axle

- Allocation. Refer to the [Electronic Parts Catalog \(ETKA\)](#).

4 - Clamp

- Always replace if removed
- Tensioning. Refer to [Fig. "Tension the clamp on the small diameter", page 309](#).



N42-10333



5 - CV Boot

- Check for tears and scuffing
- Material: Hytrel polyelastomer

6 - Clamp

- Always replace if removed
- Tensioning. Refer to [Fig. "Tightening clamp on the outer joint", page 308](#).

7 - Plate Spring

- With inner spline
- Installation position. Refer to [Fig. "Installed position, plate spring on the outer joint", page 306](#).

8 - Circlip

- Always replace if removed
- Insert in shaft groove

9 - CV Joint CV Boot

- Material: Hytrel polyelastomer
- Without vent hole
- Check for tears and scuffing
- Drive off CV joint using a drift
- Coat the sealing surface with -D 454 300 A2- before installing it on the CV joint

10 - Clamp

- Always replace if removed
- Tensioning. Refer to [Fig. "Tension the clamp on the small diameter", page 309](#).

11 - Backing Plate

12 - Internal Multi-Point Bolt

- M8 x 48
- First tighten diagonally to 10 Nm, then tighten diagonally again to the tightening specification
- 40 Nm
- After disassembly, always replace bolts

13 - Circlip

- Always replace if removed
- Remove and install using the Valve Cotter Tool Kit -VW 161A-

14 - Seal

- Always replace if removed
- The adhesive surface on CV joint must not have any grease or oil on it.

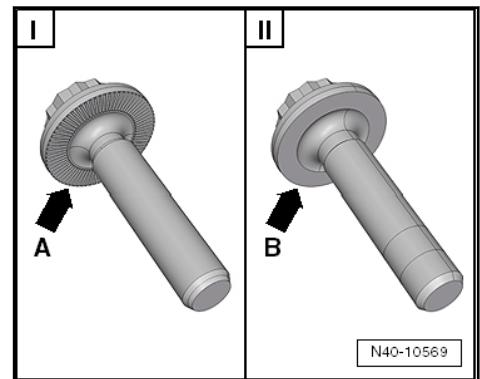
15 - Inner CV Joint

- Only replace completely
- Removing. Refer to [Fig. "Inner CV Joint, Removing", page 307](#).
- Installing. Refer to [Fig. "Inner CV Joint, Pressing On", page 308](#).
- Check using the Vehicle Diagnostic Tester Refer to [C14.6 V Joint, Checking", page 311](#).

16 - Plate Spring

- With inner spline
- Installation position. Refer to [Fig. "Installation position of the plate spring on inner joint", page 307](#).

Difference between a twelve-point bolt with ribs and a twelve-point bolt without ribs



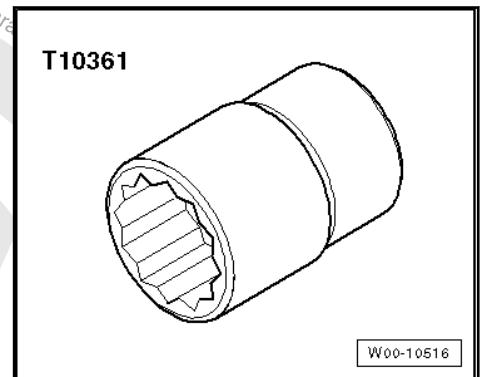
The contact surfaces -arrow A- and -arrow B- are different on the two-point bolts.

I - Twelve-Point Bolt with Ribs -arrow A-
II - Twelve-Point Bolt without Ribs -arrow B-

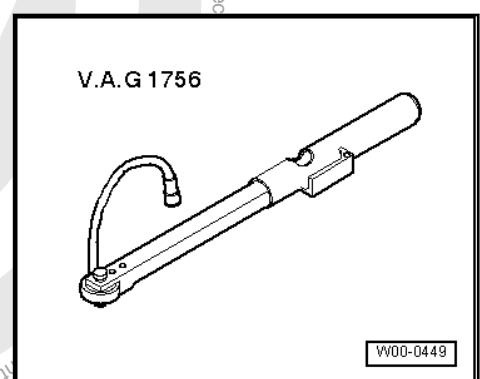
14.1 **Twelve-Point Bolt with Ribs, Loosening and Tightening, Drive Axle Threaded Connection**

Special tools and workshop equipment required

◆ Socket - 24mm -T10361-

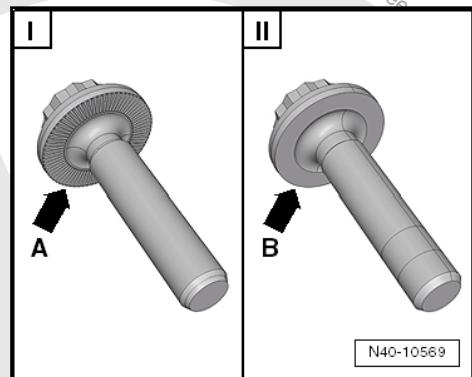


◆ Digital Torque Wrench -V.A.G 1756A-





Difference between a twelve-point bolt with ribs and a twelve-point bolt without ribs



The contact surfaces -arrow A- and -arrow B- are different on the two-point bolts.

I - Twelve-Point Bolt with Ribs -arrow A-

II - Twelve-Point Bolt without Ribs -arrow B-



Caution

Do not load the wheel bearing if the wheel-side drive axle threaded connection is loose.

If the wheel bearings are under the load of the vehicle weight, the wheel bearing will be damaged. This reduces the service life of the wheel bearings.

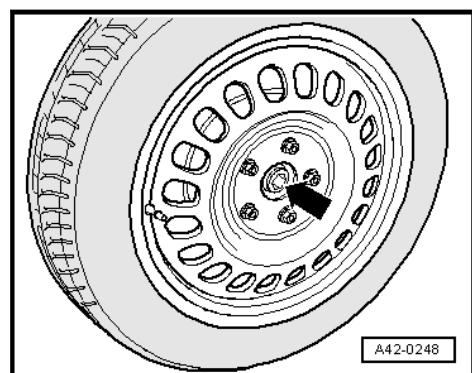
The drive axle bolt may be loosened maximum 90° when the vehicle is standing on its wheels.

Vehicles without a drive axle must not be moved, otherwise the wheel bearing will be damaged. If a vehicle must be moved, be sure to note the following:

- ◆ *Install an outer joint in place of the drive axle.*
- ◆ *Tighten the outer joint to 120 Nm.*

Twelve-Point Bolt, Loosening

- With vehicle still resting on its wheels, loosen the twelve-point bolt with the Socket - 24mm -T10361- a maximum 90°; otherwise, the wheel bearing will be damaged.
- Raise the vehicle until the wheels hang freely.
- Apply the brakes (second mechanic required).
- Remove the twelve-point bolt -arrow-.





Twelve-Point Bolt, Installing

- Replace the twelve-point bolt.



Note

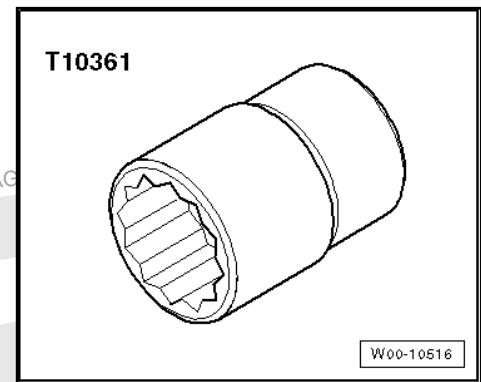
Wheels must not yet touch the ground when tightening the drive axle or the wheel bearing can be damaged.

- Apply the brakes (second mechanic required).
- Tighten the twelve-point bolt to 70 Nm.
- Set the vehicle on its wheels.
- Tighten the twelve-point bolt an additional 90°.

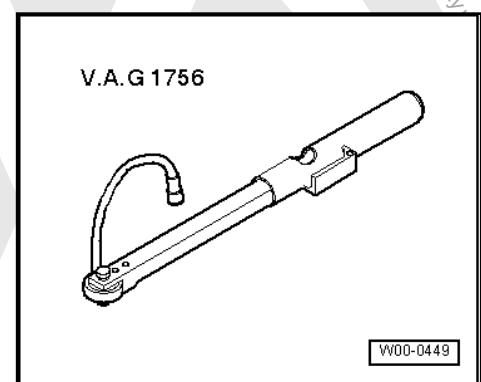
14.2 Twelve-Point Bolt without Ribs, Loosening and Tightening, Drive Axle Threaded Connection

Special tools and workshop equipment required

- ◆ Socket - 24mm -T10361-

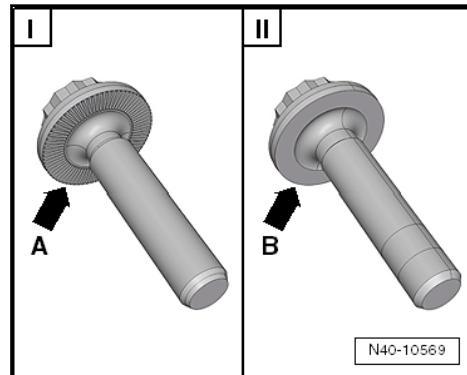


- ◆ Digital Torque Wrench -V.A.G 1756A-





Difference between a twelve-point bolt with ribs and a twelve-point bolt without ribs



The contact surfaces -arrow A- and -arrow B- are different on the two-point bolts.

I - Twelve-Point Bolt with Ribs -arrow A-

II - Twelve-Point Bolt without Ribs -arrow B-



Caution

Do not load the wheel bearing if the wheel-side drive axle threaded connection is loose.

If the wheel bearings are under the load of the vehicle weight, the wheel bearing will be damaged. This reduces the service life of the wheel bearings.

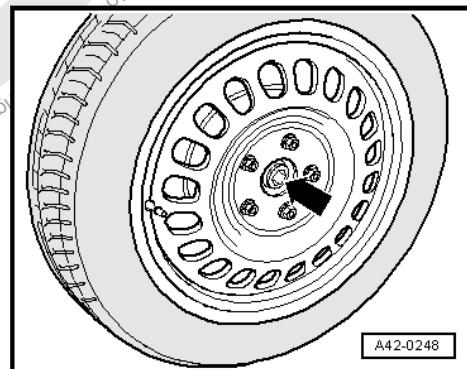
The drive axle bolt may be loosened maximum 90° when the vehicle is standing on its wheels.

Vehicles without a drive axle must not be moved, otherwise the wheel bearing will be damaged. If a vehicle must be moved, be sure to note the following:

- ◆ *Install an outer joint in place of the drive axle.*
- ◆ *Tighten the outer joint to 120 Nm.*

Twelve-Point Bolt, Loosening

- With vehicle still resting on its wheels, loosen the twelve-point bolt with the Socket - 24mm -T10361- a maximum 90°; otherwise, the wheel bearing will be damaged.
- Raise the vehicle until the wheels hang freely.
- Apply the brakes (second mechanic required).
- Remove the twelve-point bolt -arrow-.





Twelve-Point Bolt, Installing

- Replace the twelve-point bolt.



Note

Wheels must not yet touch the ground when tightening the drive axle or the wheel bearing can be damaged.

- Apply the brakes (second mechanic required).
- Tighten the twelve-point bolt to 200 Nm.
- Set the vehicle on its wheels.
- Tighten the twelve-point bolt an additional 90°.

14.3 Drive Axle, Removing and Installing

Special tools and workshop equipment required

- ◆ Torque Wrench, 40-200Nm -V.A.G 1332A-

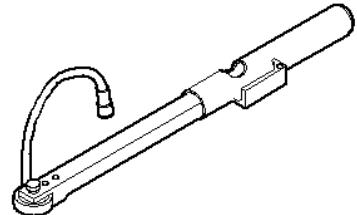
- ◆ Digital Torque Wrench -V.A.G 1756A-

V.A.G 1332



W00-0428

V.A.G 1756



W00-0449



Caution

When disassembling and performing repairs on a vehicle, the drive axles must not hang down loosely and contact the stops in the joint by over bending.

Removing

- Loosen the drive axle bolt on the wheel hub:
- ◆ Twelve-point bolt with ribs. Refer to [B14.1 bolt with Ribs, Loosening and Tightening, Drive Axle Threaded Connection](#), page 297 .



- ◆ Twelve-point bolt without ribs. Refer to [B14.2 olt without Ribs, Loosening and Tightening, Drive Axle Threaded Connection](#), page 299 .



Caution

Do not load the wheel bearing if the wheel-side drive axle threaded connection is loose.

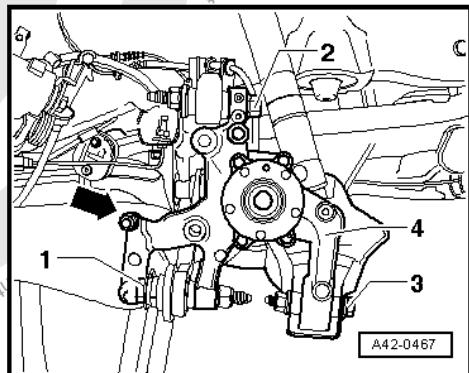
If the wheel bearings are under the load of the vehicle weight, the wheel bearing will be damaged. This reduces the service life of the wheel bearings.

The drive axle bolt may be loosened maximum 90° when the vehicle is standing on its wheels.

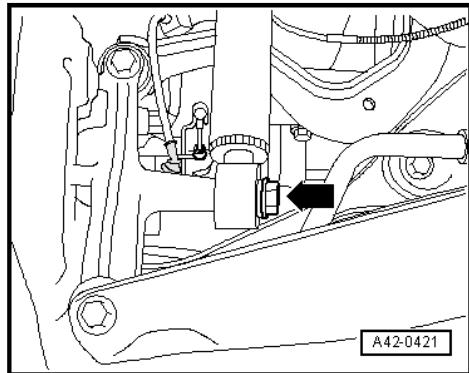
Vehicles without a drive axle must not be moved, otherwise the wheel bearing will be damaged. If a vehicle must be moved, be sure to note the following:

- ◆ *Install an outer joint in place of the drive axle.*
- ◆ *Tighten the outer joint to 120 Nm.*

- Remove the wheel.
- Remove the bolt for the tie rod -1-, and remove the lower transverse link -3- from the wheel bearing housing -4-.



- Remove the bolt -arrow-.



- Loosen input shaft at transmission flange.
- Swing wheel bearing housing upward and remove drive axle from inner splines.
- Remove the drive axle.

Installing

Install in reverse order of removal while noting the following:

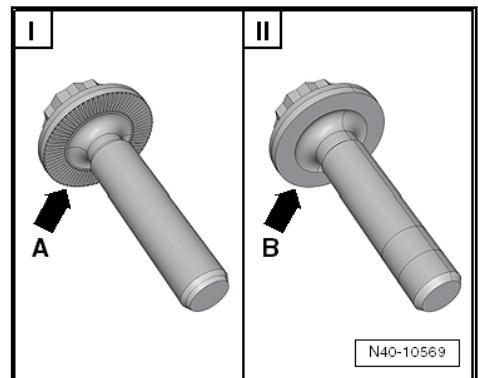
- Install the wheel and tighten. Refer to [⇒ M2 Counting Tightening Specifications](#), page 315 .
- Tighten the drive axle/wheel hub bolt:
 - ◆ Twelve-point bolt with ribs. Refer to [⇒ B14.1 Bolt with Ribs, Loosening and Tightening, Drive Axle Threaded Connection](#), page 297 .
 - ◆ Twelve-point bolt without ribs. Refer to [⇒ B14.2 Bolt without Ribs, Loosening and Tightening, Drive Axle Threaded Connection](#), page 299 .


Caution

The vehicle must not be resting on the wheels when doing so.

When the bolt is loose, the wheel bearing can be damaged by the weight of the vehicle.

Difference between a twelve-point bolt with ribs and a twelve-point bolt without ribs



The contact surfaces -arrow A- and -arrow B- are different on the two-point bolts.

I - Twelve-Point Bolt with Ribs -arrow A-

II - Twelve-Point Bolt without Ribs -arrow B-

Bolting at wheel bearing housing may only occur when the dimension between wheel hub center and lower edge of wheel housing, measured before assembly, is achieved. Refer to [⇒ Fig. “Measure dimension -a-”](#), page 209 .


Note

In vehicles with aluminum wheel bearing housings, make sure the washer is also installed between the wheel bearing housing and shock absorber.

Tightening Specifications

Component	Tightening Specification
Drive axle to wheel hub “twelve-point bolt with ribs” <ul style="list-style-type: none"> ◆ Use a new bolt 	70 Nm + 90°
Drive axle to wheel hub “twelve-point bolt without ribs” <ul style="list-style-type: none"> ◆ Use a new bolt 	200 Nm + 180°

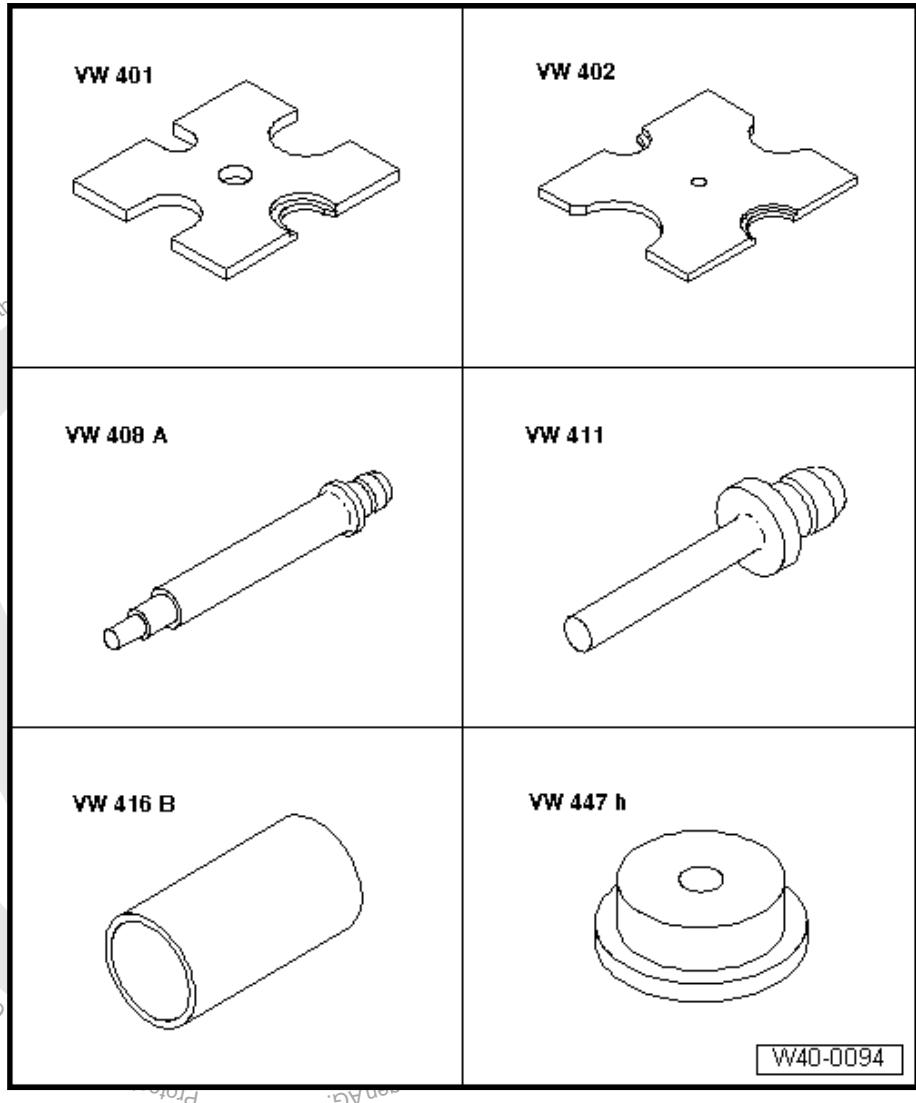


Component	Tightening Specification
Drive Axle to flange shaft/transmission ◆ Use new bolts. ◆ Use new backing plates	40 Nm ◆ Tighten to 10 Nm in a diagonal sequence

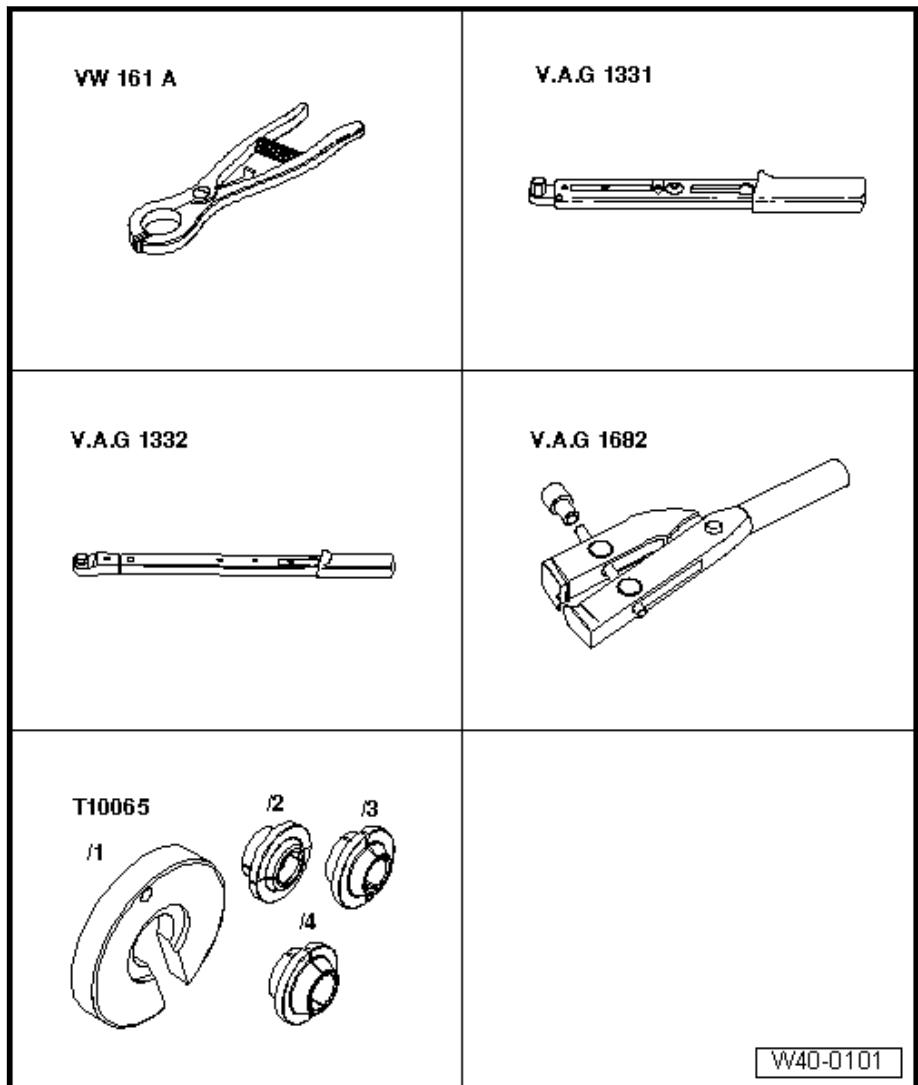
14.4 Drive Axle, Disassembling and Assembling

Special tools and workshop equipment required

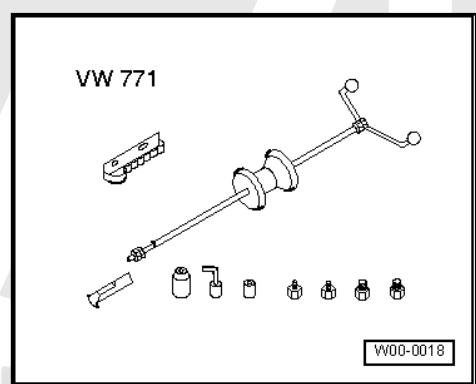
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- ◆ Press Plate -VW 401-
- ◆ Press Plate -VW 402-
- ◆ Press Piece - Rod -VW 408 A-
- ◆ Press Piece - Rod -VW 411-
- ◆ Press Piece - 37mm -VW 416 B-
- ◆ Press Piece - Multiple Use -VW 447 H-

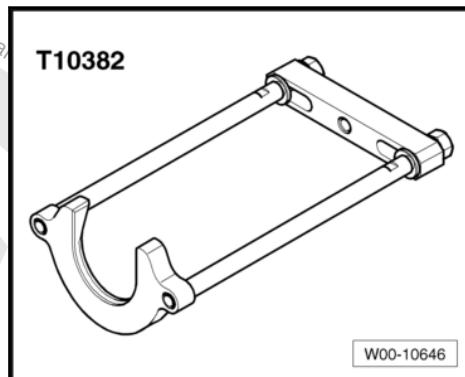


- ◆ Circlip Pliers -VW 161 A-
- ◆ Torque Wrench, 6-50Nm -VAG 1331A-
- ◆ Torque Wrench, 40-200Nm -V.A.G 1332A-
- ◆ Clamping Pliers -V.A.G 1682A-
- ◆ Tripod Joint Tool -T10065-
- ◆ Slide Hammer Set -VW 771-



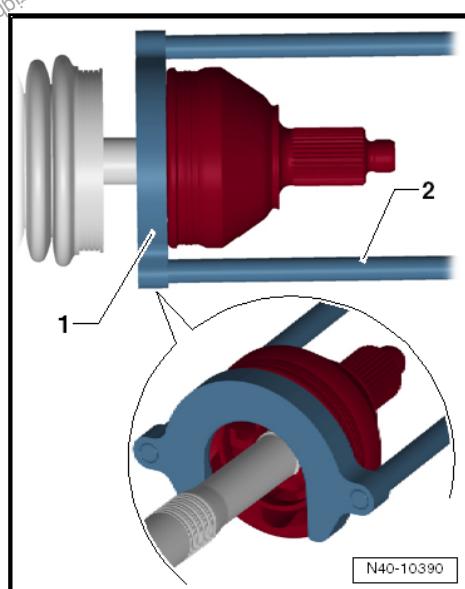


◆ Puller - Drive Axle -T10382-



Outer CV Joint, Removing

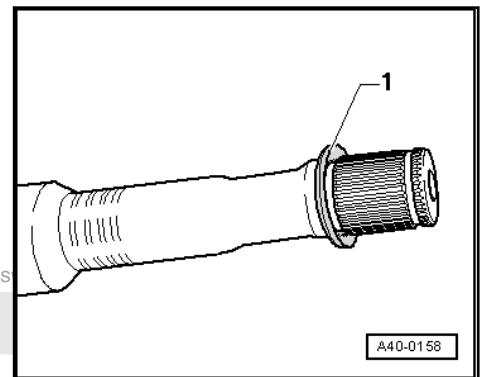
- Clamp the drive axle in a vise with jaw protectors.
- Fold back the boot.
- Align the Puller - Driveshaft -T10382- so that the flat side of the Puller - Driveshaft - Removing Plate -T10382/1- faces the Puller - Driveshaft - Spindles -T10382/2-.
- Attach the Puller - Drive Axle -T10382- to the Slide Hammer Set -VW 771-.
- Remove the CV joint from the drive axle using the Puller - Driveshaft -T10382- and Slide Hammer Set -VW 771-.



1 - Puller - Drive Axle - Removing Plate -T10382/1-
2 - Puller - Drive Axle - Spindles -T10382/2-

Outer CV Joint, Installing

Installed position, plate spring on the outer joint

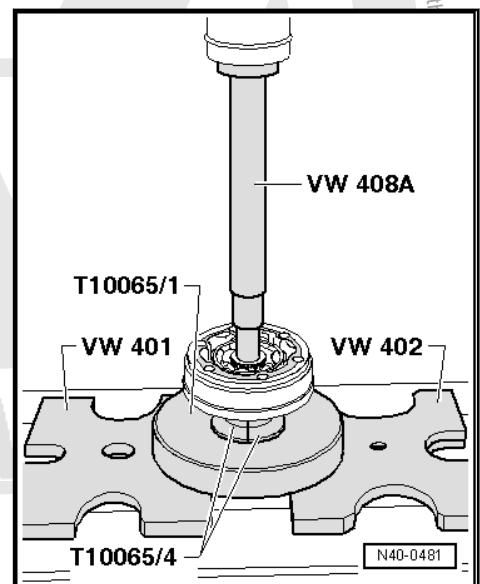


A40-0158

1 - Plate Spring

- Install the new circlips.
- Slide the new CV boot onto the drive axle if necessary.
- Drive onto the shaft using plastic hammer until the circlip engages.

Inner CV Joint, Removing

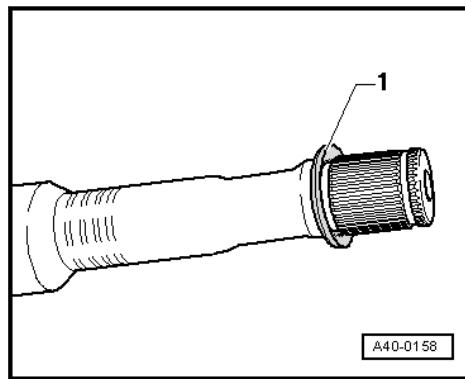


N40-0481

- Press off the CV boot from joint using drift.
- Remove the circlip.
- Remove both clamps and slide the CV boot toward the outer joint.

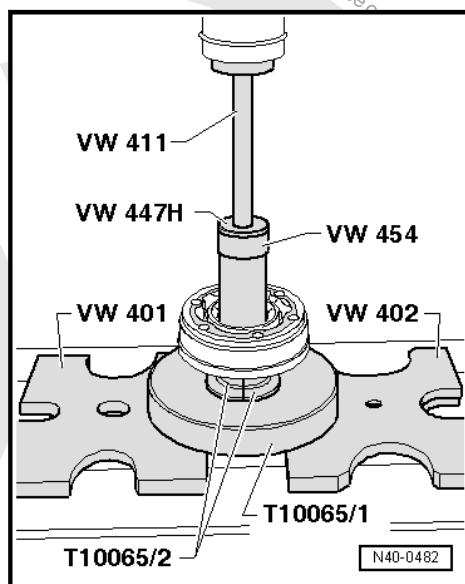
Assembling

Installation position of the plate spring on inner joint



1 - Plate Spring

Inner CV Joint, Pressing On

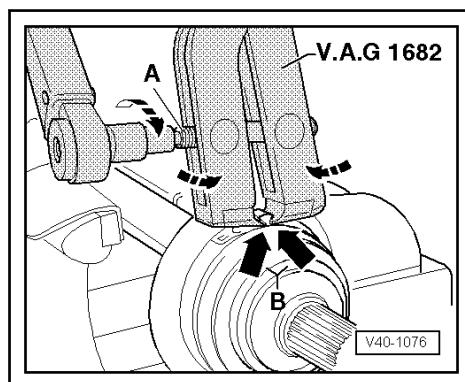


Note

Chamfer on inner diameter of ball hub (splines) must face the contact shoulder on the drive axle.

- Press on joint until it stops.
- Install the circlip.

Tightening clamp on the outer joint

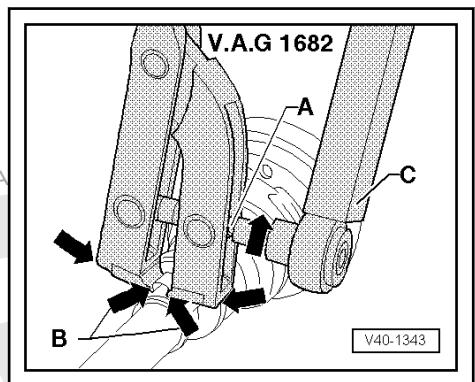


- Attach the Clamping Pliers -V.A.G 1682A- as shown. Be sure that edges of the pliers are in the corners -B arrows- of the hose clamp.
- Tension the clamp by turning spindle with a torque wrench (without tilting the pliers).


Note

- ◆ *The hard material of the CV boot (compared to rubber) makes it necessary to use a stainless steel hose clamp. It is only possible to tighten the clamp using Clamping Pliers -V.A.G 1682A-.*
- ◆ *Tightening specification: 25 Nm.*
- ◆ *Use torque wrench -C- with adjustment range 5 to 50 Nm (for example Torque Wrench 1331 5-50Nm -V.A.G 1331-).*
- ◆ *Make sure the spindle threads -A- on the pliers move easily. Lubricate with MOS 2 grease, if necessary.*
- ◆ *If it does not move freely, for example due to dirt in thread, the required clamp tension will not be achieved at the specified torque.*

Tension the clamp on the small diameter

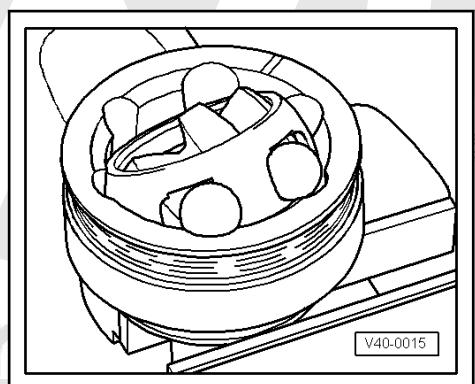


14.5 Outer CV Joint, Checking

It is necessary to disassemble the joint whenever replacing the grease or if the ball surfaces show wear or damage.

Removing

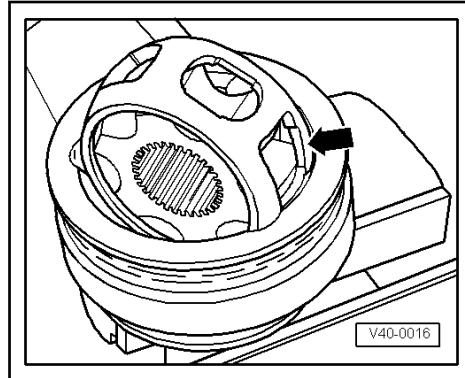
- Mark the position of ball hub to ball cage and to housing before disassembling, using an electric engraver or grindstone.



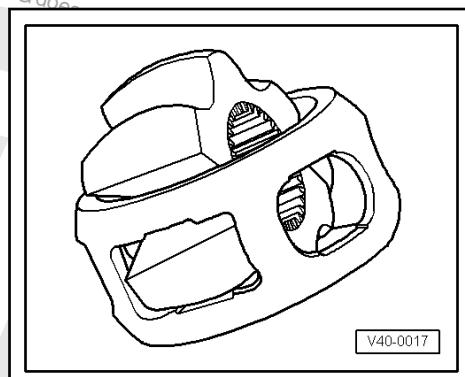
- Tilt the ball hub and ball cage.



- Remove the balls one after the other.
- Turn the cage, until two rectangular windows -arrow- rest on the joint housing.



- Lift out cage with hub.
- Swing segment of hub into rectangular window of cage.



- Fold hub out from cage.

The six balls for each joint belong to a tolerance group. Check the axle stub, hub, cage and balls for small depressions (pitting build-up) and chafing. Excessive circumferential backlash in joint makes itself noticed via tip-in shock, in such cases joint should be replaced. Flattening and running marks on the balls are no reason to replace a joint.

Installing

- Press in half of the total grease amount (40 grams) into the joint housing.
- Insert cage with hub into joint body.
- Press in the opposite facing balls one after the other, and the old ball hub position to the ball cage and to the joint housing must be replicated.
- Install the new circlip into the hub.
- Distribute remaining grease in the cover.
- Check the CV joint function.

The CV joint is properly assembled, if the ball hub can be slid back and forth by hand over the entire length adjustment.

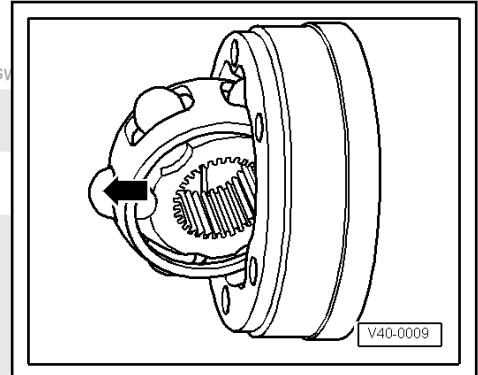


14.6 Inner CV Joint, Checking

Removing

It is necessary to disassemble the joint whenever replacing the grease or if the ball surfaces show wear or damage.

- Tilt the ball hub and ball cage.



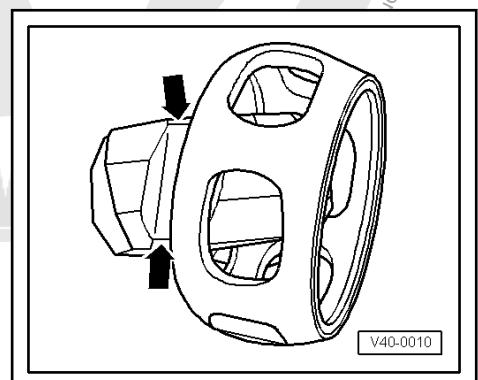
- Remove the joint in the direction of the arrow.
- Remove the balls from the cage.



Note

Ball hub and joint piece are paired. Do not interchange.

- Flip out ball hub from ball cage via the ball race -arrows-

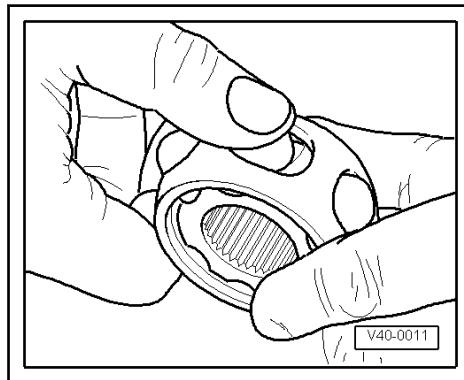


- Check the joint, ball hub, ball cage and balls for small broken off depressions (pitting) and chafing.

Excessive circumferential backlash in joint makes itself noticed via tip-in shock. Joint must be replaced in such cases. Flattening and running marks on the balls are no reason to replace the joint.

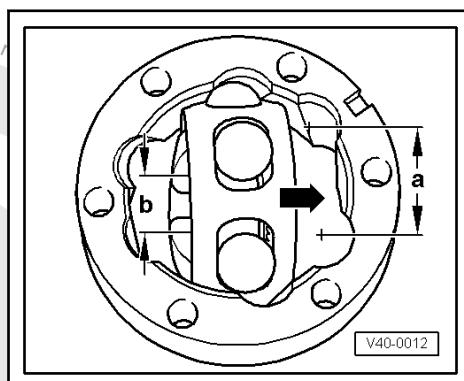
Installing

- Insert the ball hub into the ball cage via two chamfers. The installation position is arbitrary. Press balls into cage.

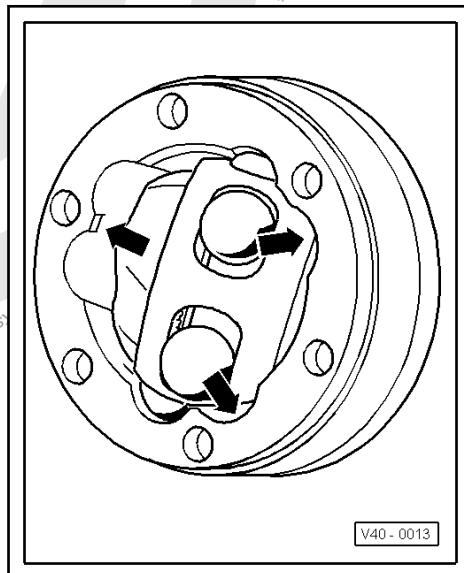


Ball hub has two different distances between ball tracks, a larger and a smaller.

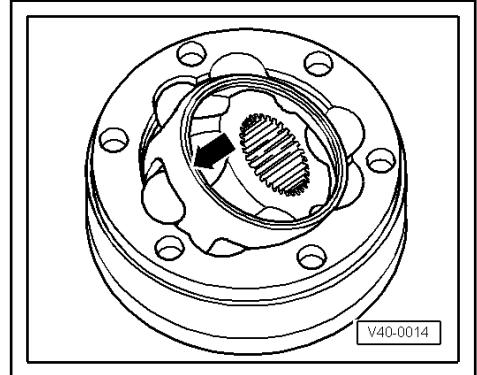
- Insert hub with cage and balls upright into joint piece, a smaller space -b- must face toward open side of joint piece when doing this.



- Also note chamfer on inner diameter of ball hub, it must be visible after swiveling in.
- Swing in ball hub; to do so, swing out hub far enough out of cage -arrows- (as depicted in illustration).



- Swing in hub with balls by pressing forcefully onto cage -arrow-.



- Check the CV joint function.

The CV joint is properly assembled, if the ball hub can be slid back and forth by hand over the entire length adjustment.



44 – Wheels, Tires, Wheel Alignment

1 Vehicles Involved in Collisions, Evaluating

For a check list for assessing the suspension on vehicles involved in a collision. Refer to [⇒ L1 ist, Assessing the Suspension on Vehicles Involved in a Collision](#), page 1.



2

Wheel Mounting Tightening Specifications

Wheel bolts to wheel hub for all vehicles

Tightening specification: 120 Nm





3 Wheels and Tires, Mounting

⇒ I3.1 nformation", page 316

⇒ R3.2 equirements", page 316

3.1 General Information

Since MY 2005, all vehicles have a new disc wheels with revised contour.

For mounting tires, the workshop mounting device must be equipped with tire mounting fixture intended for this disc wheels.



WARNING

Otherwise, there is a danger of damaging the disc wheel.

If tire mounting device has not yet been modified, contact the device manufacturer.

3.2 Assembly Requirements

Warm up cold tires to the minimum mounting temperature



Note

This also applies to ultra high performance tires (height- / width ratio smaller/same as 45% and speed rating symbol larger than/ same as V).



WARNING

The minimum mounting temperature for a tire may not be below 15°C or above 30°C in the center of the tire.

- For injury-free mounting, the upper sidewall and the upper bead inside must be minimum 15°C (59 °F).
- The internal temperature is called the core temperature.
- Rubber is a poor heat conductor, and for this reason, a cold tire must be exposed to a temperature controlled environment until the inner rubber layers have warmed up to at least 15°C (59 °F).
- The tire surface temperature during the warm-up phase is not a measure of the inside temperature.
- So that the cold tires warm up as quickly as possible, never stack them one on top of the other; store them separated from each other so that the warm air can "circulate" around them.
- Never use a room heater or a hot air gun to warm up tires because the surface temperature will heat up very quickly to a critical temperature.
- To prevent damage, only warm water or warm air (maximum 50 °C) can be used to warm up a tire!
- If cold tires (below 0 °C (32 °F)) are brought into a warm room (above 0 °C (32 °F)), a layer of ice will start to form on



the tires. This layer of ice means that humidity in the warm air is condensing on the tire.

- Once the layer of ice starts to melt, wipe up the water with a rag so that the warming up process will not be slowed down.

Warm-up time:

- Using the example of a room temperature of at least 19 °C (66.2 °F) and a tire temperature of 0 °C (32 °F) or higher, the tires should be stored for at least two hours at minimum 19 °C (66.2 °F).
- If the room temperature is minimum 19 °C (66.2 °F) and the tire temperature is below 0 °C (32 °F), then the tires should be stored for at least 2.5 hours at a minimum room temperature of 19 °C (66.2 °F).

Recommendations:

- if possible, let the tires stand in the workshop for one day before mounting them
- store the tires as high as possible on an insulated surface, pallet or something similar
- Position the tires so that they can be “surrounded” by the warm air
- Wipe off the sweat
- Never heat the tires with a room heater or a hot air gun!



4 Tires, Wheels with Tire Pressure Monitoring System, Removing and Installing

- ⇒ [P4.1 precautions and Conditions for Removing and Installing Tires, Wheels with Tire Pressure Monitoring System", page 318](#)
- ⇒ [C4.2 hanging", page 318](#)
- ⇒ [D4.3 ismounting", page 319](#)
- ⇒ [D4.4 ismounting", page 320](#)
- ⇒ [M4.5 ounting", page 321](#)

4.1 Safety Precautions and Conditions for Removing and Installing Tires, Wheels with Tire Pressure Monitoring System

- Always note the instructions and danger warnings identified in the following description!
- Check whether tire pressure sensor should be replaced
⇒ Vehicle diagnostic tester.



Note

- ◆ During removal and mounting work, make sure that no contact is made between tires and the Tire Pressure Monitoring Sensor.
- ◆ When cleaning disc wheel (rim), the tire pressure monitoring sensor must not come into contact with water or be blown with pressurized air.

4.2 Wheel, Changing

If wheels are changed (for example, change from summer to winter tires), wheel electronics send data as soon as speed of new wheels exceeds 25 km/h (15.5 mph). The control module automatically recognizes the identification numbers of the new wheel electronics.

An acceleration data check also occurs with vehicle speed. This process takes about 7 minutes.

Tire Pressure Monitoring Control Module -J502- must first switch to learning mode before it can automatically learn wheel electronics.

Vehicle must stand for 20 minutes for this. This takes five minutes after a recognized tire puncture.

If the standing time is not followed, control module is not in learning mode so system recognizes a malfunction and can only automatically learn wheel electronics after standing 20 minutes.



Note

- ◆ When changing wheels, be sure to install only Volkswagen approved wheel/tires combinations with tire pressures listed on the tank flap.
- ◆ If unapproved wheel/tire combinations are installed, they must have a German Technical Inspection Agency certificate for the respective vehicle and a second wheel set must be programmed using the Vehicle Diagnostic Tester -VAS 5051B-. Refer to [⇒, page 319](#).
- ◆ An adaptation is also needed if tire pressure deviates from pressures given on fuel filler flap. Refer to [⇒, page 319](#).

Wheel sets with other specified tire pressures

If a vehicle is equipped with tires which have specified pressures different from those listed on fuel filler flap, these tires (second wheel set) can also be monitored by the Tire Pressure Monitoring System (TPMS).

Specified values for a second wheel set must be entered in system using Vehicle Diagnostic Tester -VAS 5051B-.

Wheel electronics on wheels from second set are not automatically recognized and learned by the tire pressure monitoring system (as wheel electronics on Volkswagen approved wheel/tire combination set are).

To change to a second wheel set, the following steps must be carried out:

- ◆ Read the wheel electronic (tire pressure sensors) identification numbers (IDs) before installing.
- ◆ Switch the TPMS to wheel set 2.
- ◆ Enter needed specified tire pressures and wheel electronic IDs in system.

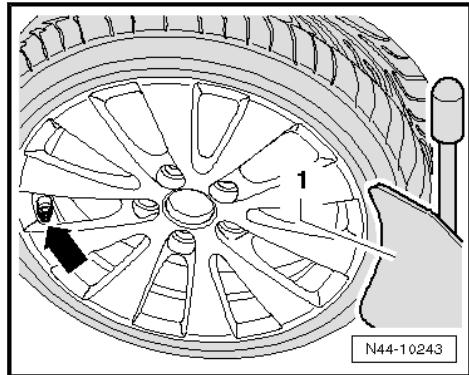
4.3 Tires, Dismounting



Caution

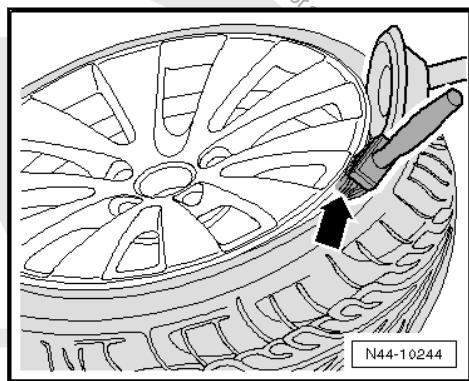
- ◆ Pay attention to the safety precautions and conditions. Refer to [⇒ P4.1 precautions and Conditions for Removing and Installing Tires, Wheels with Tire Pressure Monitoring System", page 318](#).

- Release air from tires, unscrew the nickel-coated valve insert to do so.
- When pressing off tire on a tire dismounting/mounting machine with press-off blade, always make sure that tire valve/tire pressure sensor -arrow- is located opposite the press-off blade -1--.



Press-off blade must be applied at maximum 2 cm removed from rim flange.

- Remove balancing weights and coarse dirt from disc wheel.
- Press off both tire beads all the way around while thoroughly applying tire mounting paste between the tire and rim flange -arrow-.



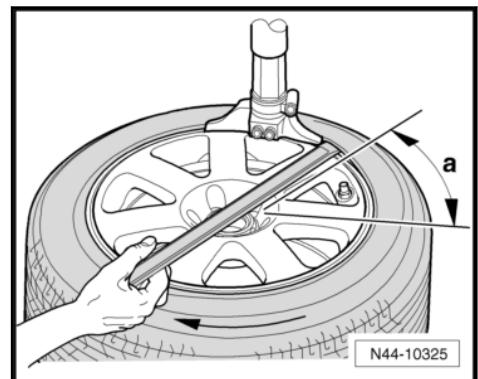
4.4 Tires, Dismounting



Caution

- ◆ Pay attention to the safety precautions and conditions. Refer to [P4.1 precautions and Conditions for Removing and Installing Tires, Wheels with Tire Pressure Monitoring System](#), page 318 .
- ◆ Mounting head must not be located in area -a- of tire valve/tire pressure monitoring sensor, otherwise the mounting head will damage the Tire Pressure Monitoring Sensor.

Removing tires



- Turn the wheel on tire mounting device so that valve Tire Pressure Monitoring Sensor is in front of mounting head.
- Position mounting head in vicinity of tire valve/tire pressure sensor so that tire iron can be put on approximately 30° next to tire valve/tire pressure sensor.
- Now pry the tire bead over the mounting finger on the mounting head using a tire iron and remove tire iron.
- Let the tire dismounting/mounting machine run clockwise until upper bead lies completely above the rim flange.
- Turn the wheel on tire mounting device so that valve Tire Pressure Monitoring Sensor is in front of mounting head.



Note

- ◆ Check the Tire Pressure Sensor for loose or damaged parts. If threaded connections are loose, the union nut, valve insert, seal, sealing washer and valve cap must be replaced by new parts from the repair set. Refer to ⇒ *Electronic Parts Catalog (ETKA)*.
- ◆ If Tire Pressure Monitoring Sensor is damaged, then it must be replaced completely. Refer to ⇒ *T7.3 ire Pressure Monitoring Sensor, Removing and Installing*, page 338 .

4.5 Tires, Mounting



Caution

- ◆ Pay attention to the instructions for warming-up cold tires to the minimum mounting temperature. Refer to ⇒ *R3.2 requirements*, page 316 .
- ◆ Pay attention to the safety precautions and conditions. Refer to ⇒ *P4.1 recautions and Conditions for Removing and Installing Tires, Wheels with Tire Pressure Monitoring System*, page 318 .



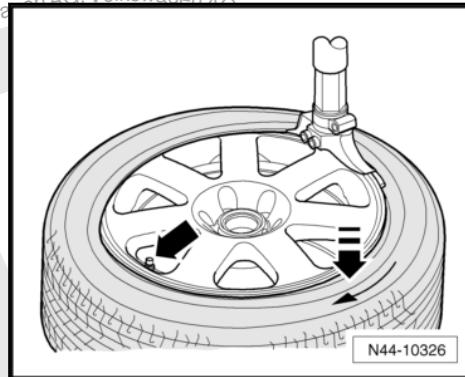
Note

When changing a tire, it is recommended to change the tire pressure sensor seals at the same time.

- Coat rim flanges, tire beads and inside of upper tire beads thoroughly with tire mounting paste.



- Install the inner side of the tire first
- Turn the disc wheel on tire mounting device so that valve/tire pressure sensor -arrow- is opposite to the mounting head.



- Push the tires between the tire valve/Tire Pressure Monitoring Sensor and the mounting head into the bed -direction of arrow-.
- Let the tire dismounting/mounting machine run clockwise.
- Mounting of the lower bead ends before the tire valve/Tire Pressure Monitoring Sensor to prevent damage to Tire Pressure Monitoring Sensor.

Tire bead now slips over the rim flange. Wheel may be turned only as far until mounting head is located just in front of tire valve/Tire Pressure Sensor.

- Make sure the tire bead is seated correctly on the mounting head and run the mounting machine clockwise.
- Mounting of the upper bead ends before the tire valve/Tire Pressure Monitoring Sensor to prevent damage to Tire Pressure Monitoring Sensor.

Tire bead now slips over the rim flange. Wheel may be turned only as far until mounting head is located just in front of tire valve/Tire Pressure Sensor.

- Inflate the tire to a inflation pressure of maximum 3.3 bar (47.86 psi) (bounce pressure).



Caution

If tire beads do not make contact completely on disc wheel edge, pressure must not be increased under any circumstances.

Pre-damage to tire or disc wheel would result.

- If tire beads do not make contact completely on disc wheel edge, then release air, press off tire bead once more and coat rim flange thoroughly again with tire mounting paste.
- Inflate the tire to a inflation pressure of maximum 3.3 bar (47.86 psi) (bounce pressure).
- If tire beads make contact on bead seat without problems, then increase inflation pressure to 4 bar (58.02 psi) to »settle« tire.
- Install a new nickel-plated valve insert and fill the tire to the specified pressure.
- Then balance wheel.



- Mount the wheel and tighten it to tightening specification.
Refer to [⇒ M2 Counting Tightening Specifications](#), page 315 .





5 Run-Flat Tires, Dismounting and Mounting

- ⇒ P5.1 recautions", page 324
- ⇒ R5.2 equirements", page 324
- ⇒ D5.3 ismounting", page 326
- ⇒ D5.4 ismounting", page 326
- ⇒ M5.5 ounting", page 329

5.1 Safety Precautions

- Work for removing and mounting tires with emergency running characteristics must only be performed by mechanics specially trained for it.
- The special tools necessary must be in proper working order and not damaged! Contact the manufacturer of tire mounting device found in the workshop directly for suitable additional tools. Additional tools are offered as recommended accessories for the tire changers listed with VAS - numbers.
- If necessary, use a mounting paste recommended by the tire manufacturer.
- The description of the procedure for dismounting and mounting may vary depending on the device manufacturer and type of device.
- The following work procedure described explains the principal procedure for removing and mounting tires with emergency running characteristics. It is important to recognize run-flat tires before starting the removal and mounting process as it will be different from the process used with standard tires.
- Characteristics: these tires are identified with the following abbreviations: DSST, Euforia, RFT, ROF, RSC, SSR or ZP. These abbreviations are located on the tire flank behind tire designation of the respective tire manufacturer.
- Always note the instructions and danger warnings identified in the following description!

Note

- ◆ During removal and mounting work, make sure that no contact is made between tires and the Tire Pressure Monitoring Sensor.
- ◆ When cleaning disc wheel (rim), the tire pressure monitoring sensor must not come into contact with water or be blown with pressurized air.

5.2 Assembly Requirements

Warm up cold tires to the minimum mounting temperature

Note

This also applies to ultra high performance tires (height-width ratio smaller/same as 45% and speed rating symbol larger than same as V).



WARNING

The minimum mounting temperature for a tire may not be below 15°C (59 °F) or above 30°C in the center of the tire.

- For injury-free mounting, the upper sidewall and the upper bead inside must be minimum 15°C (59 °F).
- The internal temperature is called the core temperature.
- Rubber is a poor heat conductor. For this reason, a cold tire must be exposed to a temperature controlled environment until the inner rubber layers have warmed up to at least 15°C (59 °F).
- The tire surface temperature during the warm-up phase is not a measure of the inside temperature.
- So that the cold tires warm up as quickly as possible from the surrounding air, never stack them one on top of the other, but rather store them separate from each other. This way, the warm air can "circulate" around the tires.
- Never use a room heater or a hot air gun to warm up tires because the surface temperature will heat up very quickly to a critical temperature.
- Using warm water or warm air (maximum 50 °C (122 °F)) is the only way to warm up a tire without damaging it!
- If cold tires (below 0 °C (32 °F)) are brought into a warm room (above 0 °C (32 °F)), a layer of frost will start to form on the tires. This layer of ice means that humidity in the warm air is condensing on the tire.
- Once the layer of frost starts to melt, wipe up the condensation with a cloth. This way the warming up process will not be slowed down by evaporation chill.

Warm-up time:

- ◆ If the tire temperature is minimum 0 °C (32 °F), then put the tire in a room for at least 2 hours where the temperature is not below 19 °C (66.2 °F).
- ◆ If the tire temperature is below 0 °C (32 °F), then put the tire in a room for at least 2.5 hours where the temperature is not below 19 °C (66.2 °F).

Recommendations:

- ◆ If possible, let the tires stand in the workshop for 1 day before mounting them.
- ◆ Store the tires as high as possible on an insulated surface, pallet or something similar.
- ◆ Position the tires so that they can be "surrounded" by the warm air.
- ◆ Wipe off the condensation.
- ◆ Never heat the tires with a heater or a hot air gun!



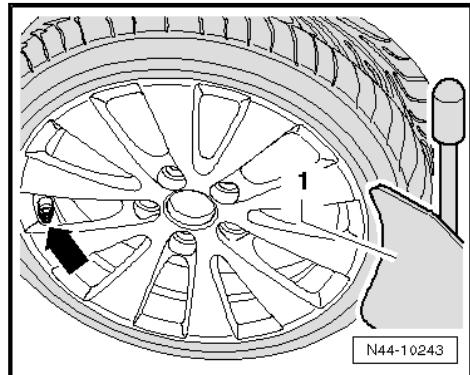
5.3 Tires, Dismounting



Caution

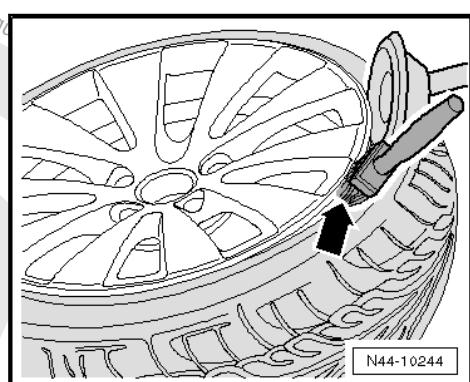
- ◆ Note the safety precautions. Refer to [P5.1 recautions](#), page 324 .

- Release air from tires, unscrew the nickel-coated valve insert to do so.
- When pressing a tire off on a tire dismounting/mounting machine, always make sure that the tire valve/Tire Pressure Sensor -arrow- is located opposite the press-off blade -1-.



Press-off blade must be applied at maximum 2 cm removed from rim flange.

- Remove the balancing weights and any large amounts of dirt from the rim.
- Press off both tire beads all the way around while thoroughly applying tire mounting paste between the tire and rim flange -arrow-.



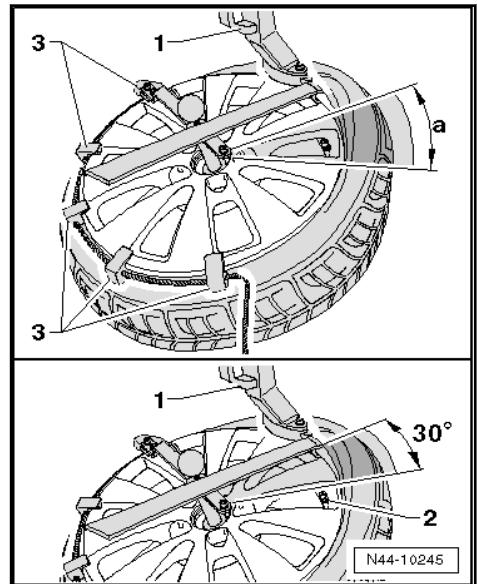
5.4 Tires, Dismounting



Caution

- ◆ Note the safety precautions. Refer to [P5.1 recautions](#), page 324 .

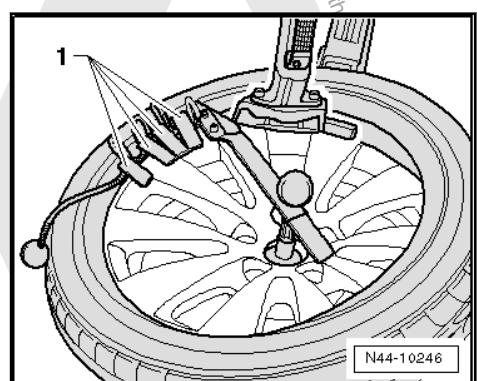
- Turn wheel on tire mounting device so that tire valve/tire pressure sensor -2- stands in front of mounting head -1-.



Caution

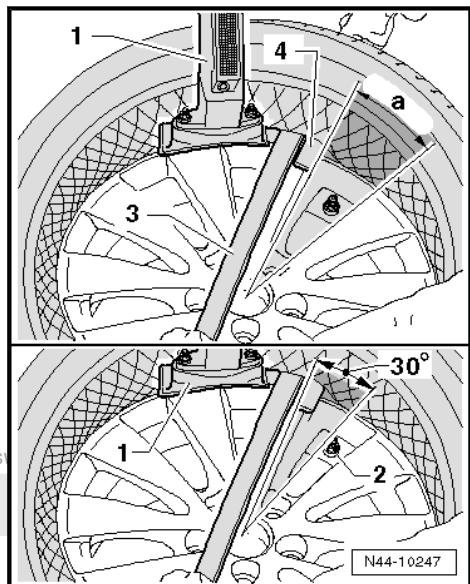
Mounting head -1- must not be located in area -a- of tire valve/tire pressure monitoring sensor, otherwise the mounting head will damage the Tire Pressure Monitoring Sensor.

- Position mounting head -1- in vicinity of tire valve/tire pressure sensor so that tire iron can be put on approximately 30° next to tire valve/tire pressure sensor -2-.
- Insert the holders -3- on the rim opposite the mounting head -1-.
- Now pry the tire bead over the mounting finger on the mounting head using a tire iron and remove tire iron.
- Let the tire dismounting/mounting machine run clockwise until the upper bead lies completely above the rim flange.



This slides the hold-down device -1- against the mounting head. This allows them to be removed again easily.

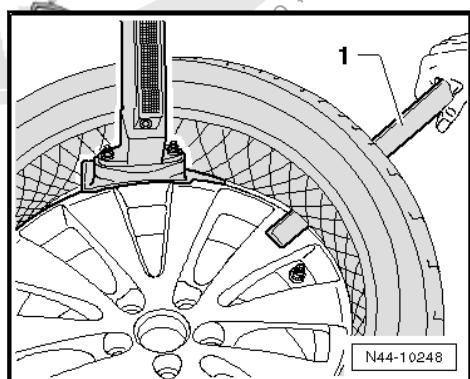
- Turn wheel on tire mounting device so that tire valve/tire pressure sensor -2- stands in front of mounting head -1-.



Caution

Mounting head -1- must not be located in area -a- of tire valve/tire pressure monitoring sensor, otherwise the mounting head will damage the Tire Pressure Monitoring Sensor.

- Position mounting head -1- in vicinity of tire valve/tire pressure sensor so that tire iron can be put on approximately 30° next to tire valve/tire pressure sensor -2-.
- Now pry the tire bead over the mounting finger on the mounting head using a tire iron -3-.
- In addition, insert a plastic mounting lever -4-.
- Remove tire iron -3- again.
- Hold the beam firmly over the rim flange from outside using the plastic mounting lever -1-. Let the tire dismounting/mounting machine run clockwise until the tire is completely removed from the rim.





Note

- ◆ Check the Tire Pressure Sensor for loose or damaged parts. If threaded connections are loose, the union nut, valve insert, seal, sealing washer and valve cap must be replaced by new parts from the repair set. Refer to ⇒ *Electronic Parts Catalog (ETKA)*.
- ◆ If Tire Pressure Monitoring Sensor is damaged, then it must be replaced completely. Refer to ⇒ *-7.2 Tire Pressure Monitoring Sensor*, page 336.

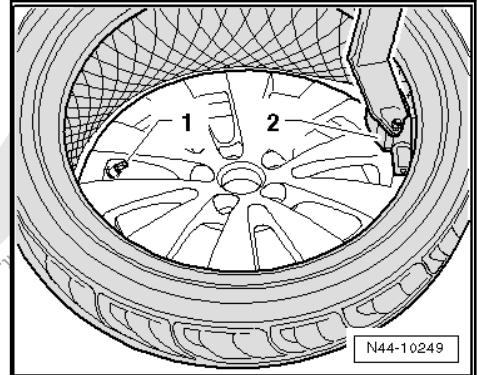
5.5 Tires, Mounting



Caution

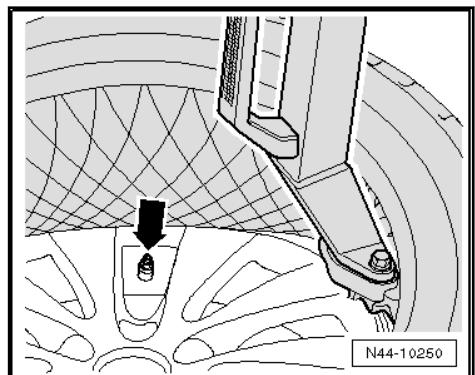
- ◆ Pay attention to the instructions for warming-up cold tires to the minimum mounting temperature. Refer to ⇒ *R5.2 requirements*, page 324.
- ◆ Note the safety precautions. Refer to ⇒ *P5.1 recautions*, page 324.

- Coat rim flanges, tire beads and inside of upper tire beads thoroughly with tire mounting paste.
- Turn the rim on the tire dismounting/mounting machine so that the tire valve/Tire Pressure Sensor -1- is opposite the mounting head -2-.



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- Let the tire dismounting/mounting machine run clockwise.
- The lower bead assembly ends in front of the tire valve/Tire Pressure Monitoring Sensor -arrow- to prevent damage to the Tire Pressure Monitoring Sensor.

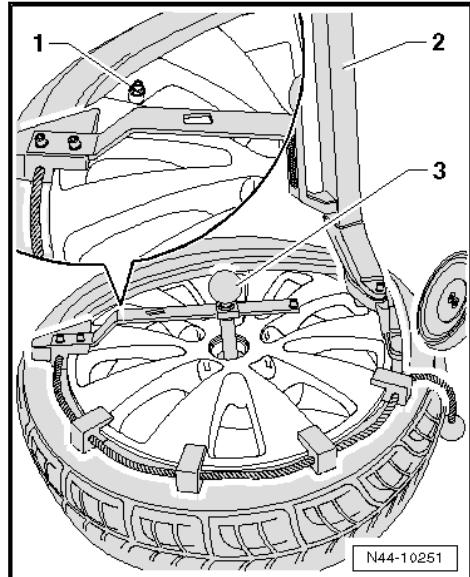


N44-10250

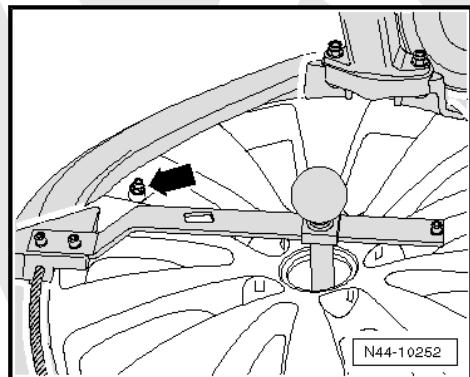


The tire bead now slips over the rim flange. Wheel may be turned only as far until mounting head is located just in front of tire valve/tire pressure sensor -arrow-.

- Turn the rim on the tire dismounting/mounting machine so that the tire valve/Tire Pressure Sensor -1- is opposite the mounting head -2-.



- Position the holder -3- on the rim.
- Make sure the tire bead is seated correctly on the mounting head and run the mounting machine clockwise.
- The upper bead assembly ends in front of the tire valve/Tire Pressure Monitoring Sensor -arrow- to prevent damaging the Tire Pressure Monitoring Sensor.



The tire bead now slips over the rim flange. Wheel may be turned only as far until mounting head is located just in front of tire valve/tire pressure sensor -arrow-.

- Remove press holders from rim flange.
- Inflate the tire to a maximum pressure of 3.3 bar (47.86 psi) (bounce pressure).

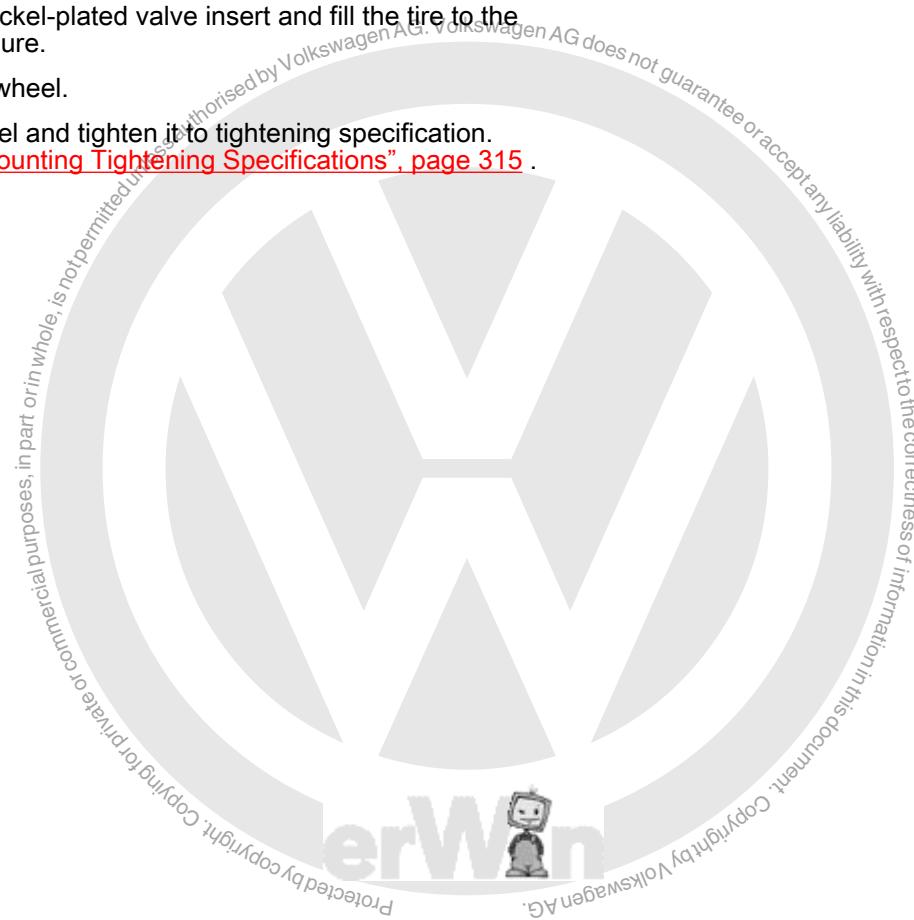


Caution

If tire beads do not make contact completely on disc wheel edge, pressure must not be increased under any circumstances.

Damage to the tire or wheel rim would result.

- If the tire beads do not make contact completely on the rim edge, then release air. Press off tire bead once more and thoroughly coat the rim flange again with tire mounting paste.
- Inflate the tire to a maximum pressure of 3.3 bar (47.86 psi) (bounce pressure).
- If tire beads make contact on bead seat without problems, then increase tire pressure to 4 bar (58.02 psi) to »settle« tire.
- Install a new nickel-plated valve insert and fill the tire to the specified pressure.
- Then balance wheel.
- Mount the wheel and tighten it to tightening specification. Refer to [⇒ MOUNTING/TIGHTENING SPECIFICATIONS](#), page 315 .





6 Tire Pressure Monitoring System

- ⇒ [I6.1 Information", page 332](#)
- ⇒ [M6.2 Malfunction in ABS System", page 332](#)
- ⇒ [S6.3 Setting, Performing", page 333](#)

6.1 General Information

The tire pressure monitoring system is included in the software in the ABS Control Module -J104-. The system will recognize a slow and gradual decrease in tire pressure on a wheel. The DTC memory entries for tire pressure monitoring system are stored in the ABS Control Module -J104-. With the help of the ABS sensors, the TPMS compares the speed and rolling circumference of the individual tires.

After the following work and/or changes and with the ignition switched on, the Tire Pressure Monitoring Display Button - E492- must be pressed until the confirmation chime sounds:

- ◆ Tire pressure change
- ◆ A change in one or more tires
- ◆ Changing a tire, for example, from front to rear
- ◆ Removing or installing one or multiple tires

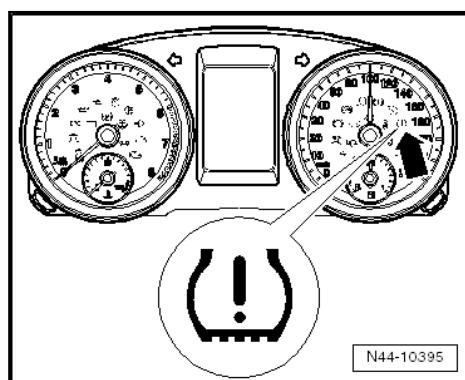
If a tire has changed in circumference, the Tire Pressure Monitoring Display Indicator Lamp -K220- in the instrument cluster will turn on. Rolling circumference of a tire may change due to:

- ◆ Insufficient tire pressure
- ◆ Structural damage on tires
- ◆ Load on vehicle on one side
- ◆ High load on one axle, when towing trailer for example
- ◆ When snow chains are used
- ◆ when spare wheel is installed
- ◆ one wheel is replaced

6.2 System Malfunction in ABS System

System Malfunction in ABS System

If the ASR/ESP Indicator Lamp -K155- or the Traction Control Indicator Lamp -K86- indicate a malfunction in the ABS system, then the Tire Pressure Monitoring Display Indicator Lamp -K220- -arrow- will also illuminate. A malfunction in the tire pressure monitoring system has not been stored.





Indicator lamp cannot be turned off by pressing Tire Pressure Monitoring Display Button -E492-. In this case, perform the following steps:

- Connect the ⇒ Vehicle diagnostic tester and select “Guided Fault Finding”.

Chassis

Brake System

01-OBD

03-Brake System ABS Mark 70 or

03-Brake System ESP Mark 60

Functions

General Functions

Adapt the tire pressure monitoring system

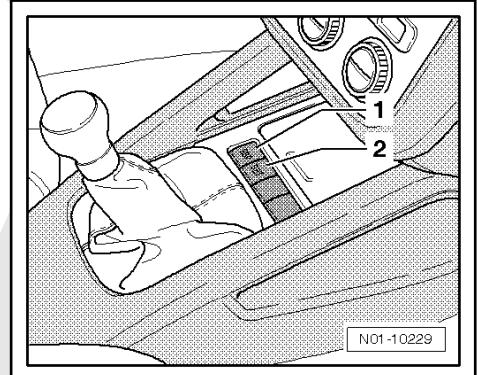
Follow the instructions on the screen to perform the basic setting.

6.3 Basic Setting, Performing

Perform a basic setting each time a change is made to the wheels.

- The ignition must be on.
- The vehicle must be standing and the parking brake must be set.

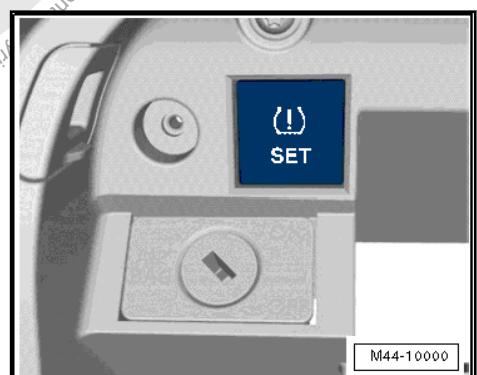
Vehicles with button in center console



- Push the **SET** -2- button inside the glove compartment until the signal tone sounds.

The signal tone confirms the basic setting.

Vehicles with button in glove compartment





- Push the **SET** button inside the glove compartment until the signal tone sounds.

The signal tone confirms the basic setting.





7 Tire Pressure Monitoring System

⇒ [F7.1 unctions", page 336](#)

⇒ [-7.2 Tire Pressure Monitoring Sensor ", page 336](#)

⇒ [T7.3 ire Pressure Monitoring Sensor, Removing and Installing", page 338](#)

Wheel electronics are mounted on each wheel for tire pressure monitoring.

The wheel electronics regularly send data that is received by the central locking and anti-theft system antennas and directed to the Tire Pressure Monitoring Control Module -J502-.

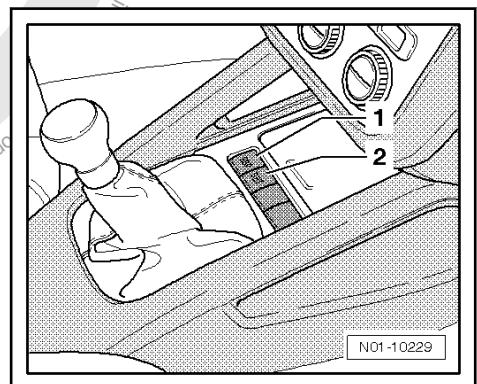
This control module is integrated with a diagnostic address in the Comfort System Central Control Module -J393-.

All specified tire pressure values (control pressures) are programmed in the control module at the factory.

The pressures apply to a set of wheels with approved tires recommended by Volkswagen and noted on the fuel filler flap.

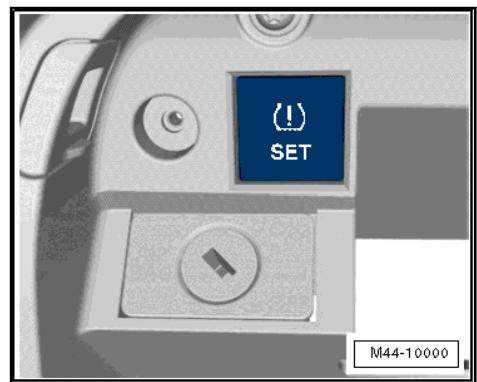
The specified tire pressures for this wheel set are given for partial and complete vehicle load and must not be changed.

Vehicles through MY 2009



Use the **[SET]** -2- button in the center console to switch between full and partial load, to check the status and to switch tire pressure monitoring on or off.

From MY 2010



Use the **[SET]** button in the glove compartment to switch between full and partial load, to check the status and to switch tire pressure monitoring on or off.



Caution

This button is not for the North American region (NAR). Therefore, the previously described function does not apply to this region.

Messages and warnings are shown via lights in instrument panel and texts in instrument panel display.

7.1 Button Functions

This table lists the function of buttons under various conditions/actions in regard to various functions.



Caution

This button is not for the North American region (NAR).

	Length of time button is held pressed			
	up to 2 seconds	3 to 7 seconds	8 to 10 seconds	11 to 15 seconds
Condition/action	Present condition	Switching	Confirming	Switching off
Desired functions:	Messages:	Messages:	Messages:	Messages:
Switch from full to partial load	Tire full load monitored (gong)	Tire partial load on.	When released: Gong confirms switch	
Switch from partial to full load	Tire partial load monitored (gong)	Tire full load on.	When released: Gong confirms switch	
Switching on	Tire pressure monitoring off.	Tire partial load on.	When released: Gong confirms switch	
Switching off	Tire full load monitored or Tire partial load monitored (gong)	Tire partial load on. or Tire full load on.		Tire pressure monitoring off. (gong)
Status check	For example: Tire pressure monitoring off. or Tire partial load monitored (gong)	After releasing: Press longer to switch on. or Press longer to switch on or switch off.		

7.2 Overview - Tire Pressure Monitoring Sensor

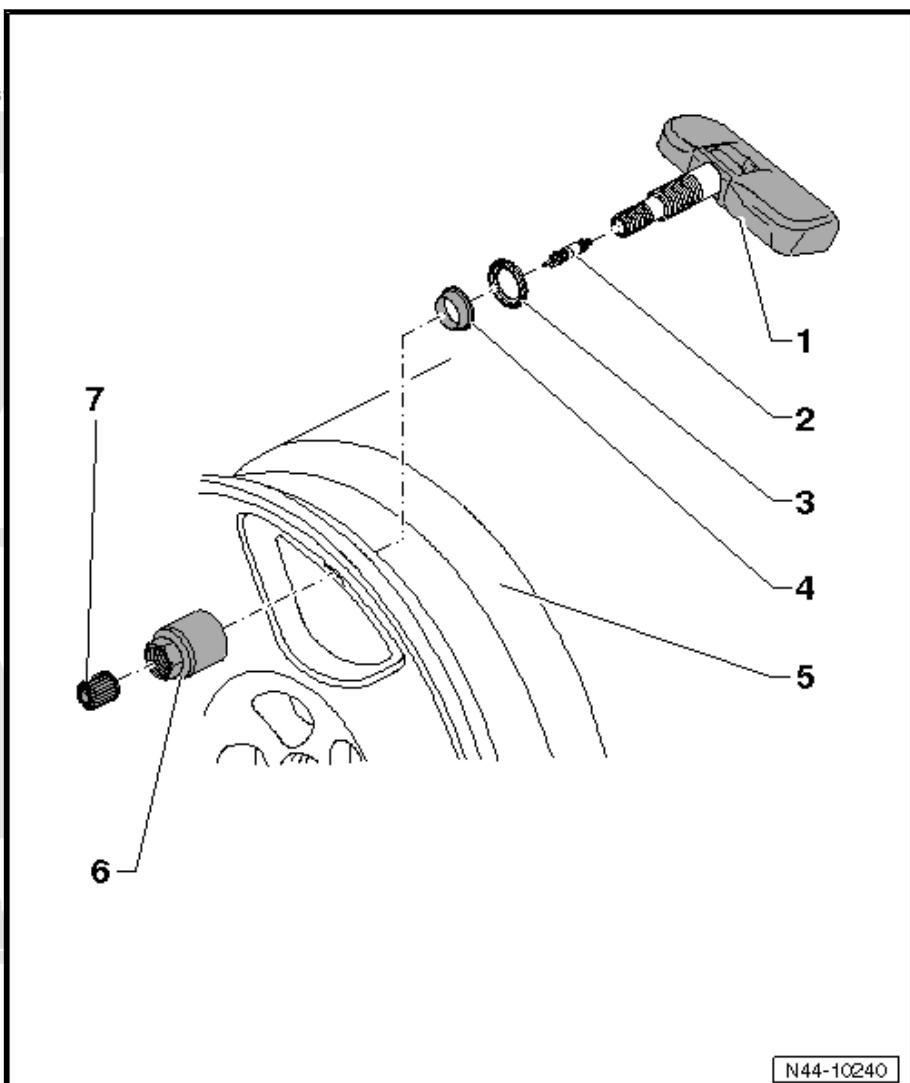


1 - Tire Pressure Monitoring Sensor

- Supplied complete as a service part.
- Removing and Installing. Refer to [⇒ T7.3 ire Pressure Monitoring Sensor, Removing and Installing", page 338](#).
- When battery is discharged, the entire Tire Pressure Monitoring Sensor must be replaced.
- After using a wheel repair kit, the bore for the valve and opening of the pressure sensor must be wiped clean.

2 - Valve Insert

- Allocation. Refer to the [⇒ Electronic Parts Catalog \(ETKA\)](#).
- Replace at every tire change



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Note

Use only original manufacturer valve insert, it has a special coating!

3 - Sealing Washer

4 - Seal

5 - Disc Wheel

- Mounting tires (wheels with tire pressure monitoring system). Refer to [⇒ W4 heels with Tire Pressure Monitoring System, Removing and Installing", page 318](#).
- Mounting tires with emergency running characteristics. Refer to [⇒ T5 ires, Dismounting and Mounting", page 324](#).

6 - Union Nut

- 8 Nm

7 - Valve Cap

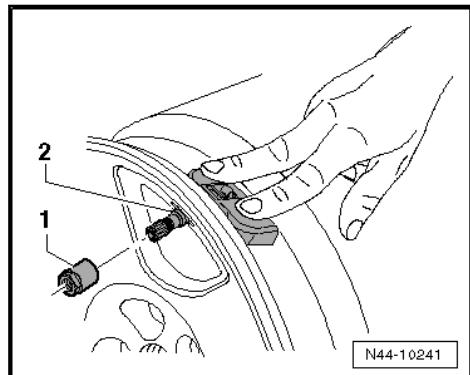
- Use only original valve caps from the repair set. Refer to the [⇒ Electronic Parts Catalog \(ETKA\)](#).
- Do not use Comfort valve caps and metal caps



7.3 Tire Pressure Monitoring Sensor, Removing and Installing

Removing

- Remove the union nut -1-.



- Remove tire pressure sensor -2- from rim well.

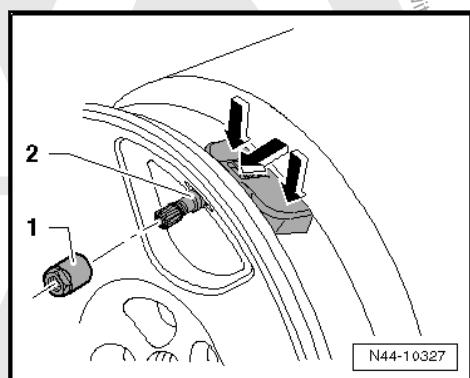
Installing



Caution

Clean the valve opening before installing the Tire Pressure Sensors.

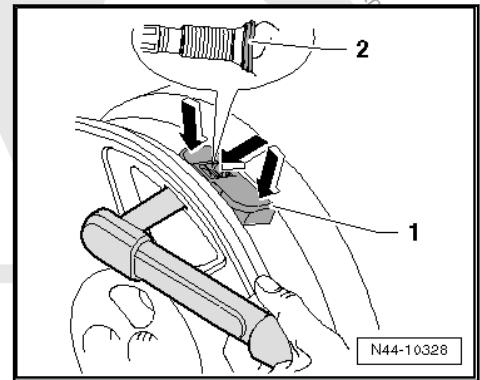
- Insert the tire pressure sensor -2- with new seal and sealing washer and press it on the spots marked with the -arrows- into the disc wheel (rim).



- Press the Tire Pressure Monitoring Sensor -2- on the spots marked with the -arrows- into the disc wheel (rim).

Screw on union nut -1- from outside onto tire pressure sensor.

- Press the tire pressure sensor -1- on the spots marked with the -arrows- into the rim and tighten the union nut to 8 Nm.



Caution

- ◆ **Tighten the union nut to the tightening specification only.**
- ◆ **Sealing washer -2- becomes slightly deformed when doing this.**
- ◆ **The sealing washer can be installed one time only. At every installation, replace the sealing washer and rubber seal with new parts.**
- ◆ **Do not tighten the union nut again. This will damage the seal and it will leak.**

Tightening Specification

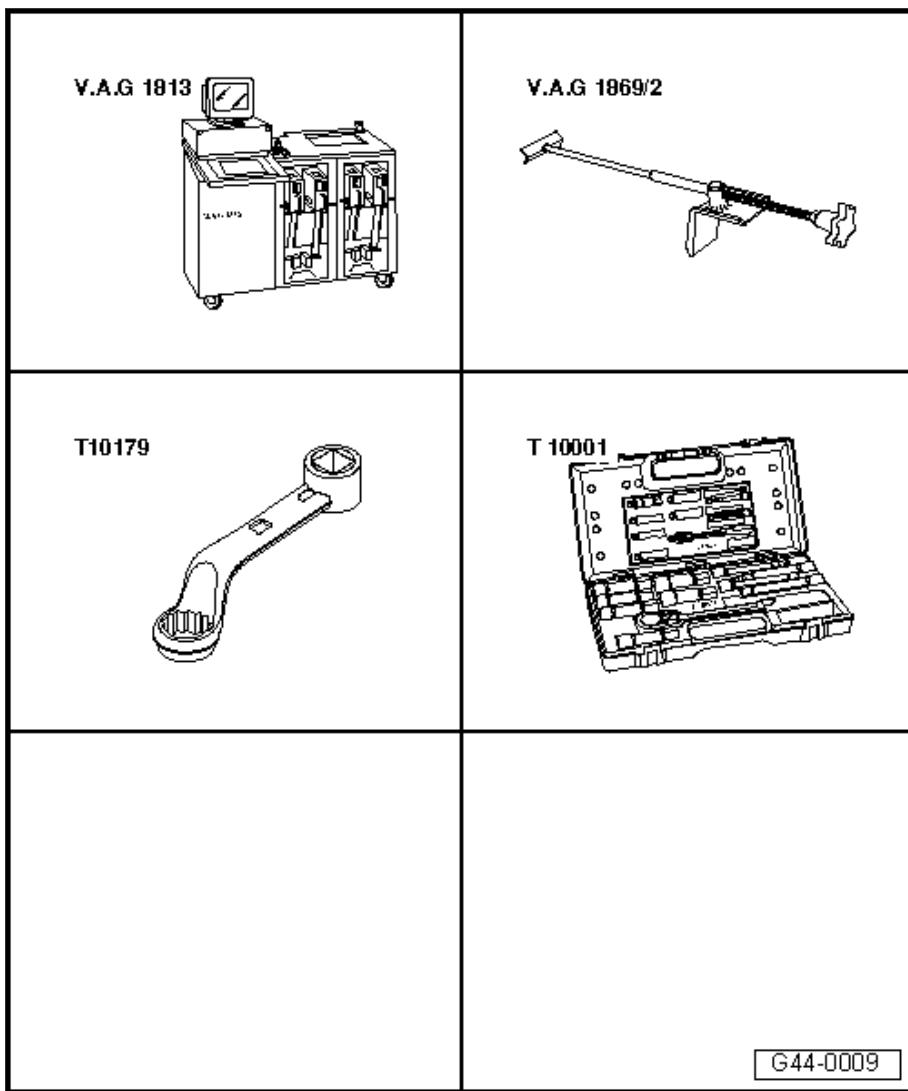
Component	Tightening Specification
Union nut to Tire Pressure Monitoring Sensor	8 Nm



8 Wheel Alignment

- ⇒ [I8.1 Information", page 341](#)
- ⇒ [R8.2 Requirements", page 342](#)
- ⇒ [P8.3 Reparations", page 343](#)
- ⇒ [A8.4 Alignment Specified Values", page 343](#)
- ⇒ [O8.5 Overview for Vehicle Alignment", page 345](#)
- ⇒ [A8.6 Axle Camber, Correcting", page 346](#)
- ⇒ [A8.7 Axle Camber, Adjusting", page 348](#)
- ⇒ [A8.8 Axle Toe, Adjusting", page 350](#)
- ⇒ [A8.9 Axle Toe, Adjusting", page 351](#)
- ⇒ [S8.10 Setting for Steering Angle Sensor G85 ", page 352](#)
- ⇒ [D8.11 Data Label", page 353](#)

Special tools and workshop equipment required



- ◆ Wheel Alignment Computer -V.A.G 1813F- or VW/Audi approved wheel alignment devices
- ◆ Brake Pedal Actuator -V.A.G 1869/2-.



- ◆ Insert Tool \leq 18mm -T10179-
- ◆ Shock Absorber Set -T10001-

8.1 General Information

Wheel alignment must only be performed using VW/Audi-approved alignment equipment.

Wheel alignment checks must always include both the front and rear axles.

Otherwise the center position of steering rack cannot be guaranteed!

- Perform alignment using the alignment computer.

All information needed for the alignment can be found in the alignment computer.

Current data »Updates« are stored on the VW Service Net.

Refer to ⇒ VW Service Net; Systems; Vehicle Alignment Software; Vehicle Alignment; Beissbarth.

Refer to ⇒ VW Service Net; Systems; Vehicle Alignment Software; Vehicle Alignment; Hunter.

Refer to ⇒ VW Service Net; Systems; Vehicle Alignment Software; Vehicle Alignment; Corghi.

Refer to ⇒ VW Service Net; Systems; Vehicle Alignment Software; Vehicle Alignment; John Bean.

Note

- ◆ An alignment should not be done until the vehicle has been driven 1,000 to 2,000 km (621.4 to 1,242.7 miles), since it takes this long for the coil springs to settle.
- ◆ The individual specifications should be followed as exactly as possible when making adjustments.

A wheel alignment is necessary if:

- ◆ Vehicle shows handling problems.
- ◆ There is accident damage and components were replaced.
- ◆ Axle components have been removed or replaced.
- ◆ Tire wear patterns are uneven.

Components replaced

Front axle component replaced	Wheel alignment check required		Rear axle component replaced	Wheel alignment check required	
	Yes	No		Yes	No
Lower Control Arm		X	Lower Transverse Link	X	
Bonded rubber bushings for control arm		X ¹⁾	Upper Transverse Link	X	
Wheel Bearing Housing	X		Tie Rod	X	
Tie rod/tie rod end	X		Wheel Bearing Housing	X	
Steering Gear	X		Subframe	X	
Subframe		X	Coil Spring		X
Suspension Strut		X	Shock Absorber		X
Bracket for subframe	X		Stabilizer Bar		X



Front axle component replaced	Wheel alignment check required		Rear axle component replaced	Wheel alignment check required	
	Yes	No		Yes	No
Stabilizer Bar		X ¹⁾	Trailing Arm	X	

¹⁾ Requirement: Subframe and brackets were secured before removal. Refer to [⇒ a3.5 nd Brackets, Securing", page 16](#).

Components removed and installed

Components of front axle removed and installed	Wheel alignment check required		Components of rear axle removed and installed	Wheel alignment check required	
	Yes	No		Yes	No
Lower Control Arm		X ¹⁾	Lower Transverse Link	X	
Wheel Bearing Housing		X	Upper Transverse Link	X	
Tie rod/tie rod end	X		Tie Rod	X	
Steering Gear	X		Wheel Bearing Housing	X	
Subframe		X ¹⁾	Subframe	X	
Suspension Strut		X	Coil Spring		X
Bracket for subframe		X ¹⁾	Shock Absorber		X
Stabilizer Bar		X ¹⁾	Stabilizer Bar		X
			Trailing Arm	X	

¹⁾ Requirement: Subframe and brackets were secured before removal. Refer to [⇒ a3.5 nd Brackets, Securing", page 16](#).

8.2 Test Requirements

- Suspension, wheel bearing, steering and steering linkage checked for excessive play and damage.
- Tread depth difference may be no more than 2 mm on an axle.
- Tires inflated to specified pressure.
- Vehicle curb weight
- Fuel tank must be full.
- Spare tire and vehicle tools are installed in appropriate position in vehicle.
- The washer fluid reservoir must be full.
- Make sure the sliding plates and turn tables are not touching the end stop when taking measurements.

CAUTION!

- The test equipment must be properly adjusted and attached to the vehicle; observe device manufacturer operating instructions.

If necessary, contact the manufacturer for instruction on the proper use of the alignment tester.

After a certain period, wheel alignment platforms and computer equipment can lose their original leveling setting and adjustments.



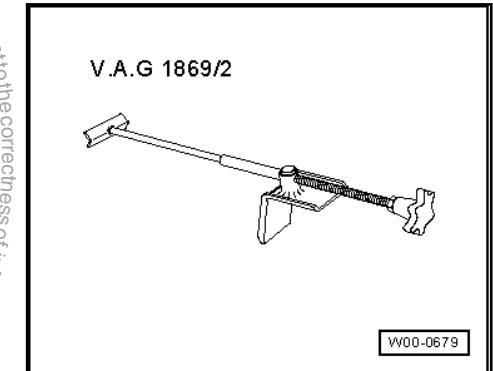
Wheel alignment platforms and alignment tester/computer should be serviced and if necessary calibrated at least once a year.

- Treat these highly sensitive units carefully and conscientiously!

8.3 Measurement Preparations

Special tools and workshop equipment required

- ◆ Brake Pedal Actuator -V.A.G 1869/2-.



The lateral run-out of the wheel must be balanced (compensated for). Otherwise, the measurement result will be false.

A correct toe-in adjustment will not be possible without performing lateral run-out compensation!

For this, observe the notes by the manufacturer of the alignment tester.

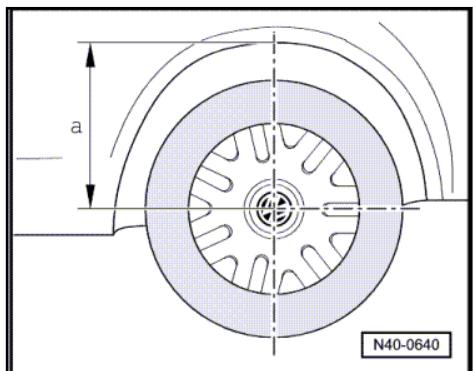
- Perform wheel run-out compensation.
- Insert the Brake Pedal Actuator -V.A.G 1869/2-.
- Actuate the brake pedal using brake pedal actuator.

8.4 Wheel Alignment Specified Values

Specified values valid for all engine versions.

- ◆ For an explanation of the PR number, refer to [page 353](#).

Standing heights listed in the table refer to dimension -a-.



Front Axle	Basic suspension	Sport suspension except 18" wheels	Sport suspension with 18" wheels
PR numbers	2UA, 2UA+2JK, G11, G24, G26+2UC	2UC, G25, G58	2UC, G02, G05, G07, G25, G33, G58, G80
Total toe (wheels not pressed)	$10' \pm 10'$	$10' \pm 10'$	$10' \pm 10'$
Camber (in straight-ahead position)	$-30' \pm 30'$	$-41' \pm 30'$	$-41' \pm 30'$



Front Axle	Basic suspension	Sport suspension except 18" wheels	Sport suspension with 18" wheels
PR numbers	2UA, 2UA+2JK, G11, G24, G26+2UC	2UC, G25, G58	2UC, G02, G05, G07, G25, G33, G58, G80
Maximum permissible difference between both sides	maximum 30'	maximum 30'	maximum 30'
Toe-out angle ¹⁾ with steering wheel turned 20° to left and right	1°38' ± 20'	1°40' ± 20'	1°40' ± 20'
Caster	7° 34' ± 30'	7° 47' ± 30'	7° 47' ± 30'
Maximum permissible difference between both sides	maximum 30'	maximum 30'	maximum 30'
Standing height	382 ± 10 mm	367 ± 10 mm	367 ± 10 mm

¹⁾ The toe angle difference can also be indicated negatively in alignment computer, depending on manufacturer.

Front Axle	Heavy duty suspension	Mexico, Russia	
PR numbers	2UB	G10, G46, G47, 2UD	
Total toe (wheels not pressed)	10' ± 10'	10' ± 10'	
Camber (in straight-ahead position)	-14' ± 30'	-22' ± 30'	
Maximum permissible difference between both sides	maximum 30'	maximum 30'	
Toe-out angle ¹⁾ with steering wheel turned 20° to left and right	1°38' ± 20'	1°16' ± 20'	
Caster	7° 17' ± 30'	7° 26' ± 30'	
Maximum permissible difference between both sides	maximum 30'	maximum 30'	
Standing height	402 ± 10 mm	392 ± 10 mm	

¹⁾ The toe angle difference can also be indicated negatively in alignment computer, depending on manufacturer.

Specified values valid for all engine versions.

◆ For an explanation of the PR number, refer to [page 353](#).

Rear axle, Front and AWD	Basic suspension	Sport suspension except 18" wheels	Sport suspension with 18" wheels
Camber	-1° 20' ± 30'	-1° 20' ± 30'	-1°45' ± 30'
Maximum permissible difference between both sides	maximum 30'	maximum 30'	maximum 30'
Total toe (at prescribed camber)	+10' ± 12,5'	+10' ± 12,5'	+10' ± 12,5'
Maximum permissible deviation from the running direction	maximum 20'	maximum 20'	maximum 20'
Standing height	380 ± 10 mm	365 ± 10 mm	365 ± 10 mm

Rear axle, Front and AWD	Heavy duty suspension	Mexico, Russia	
Camber	-1° 20' ± 30'	-1° 20' ± 30'	
Maximum permissible difference between both sides	maximum 30'	maximum 30'	
Total toe (at prescribed camber)	+10' ± 12,5'	+10' ± 12,5'	

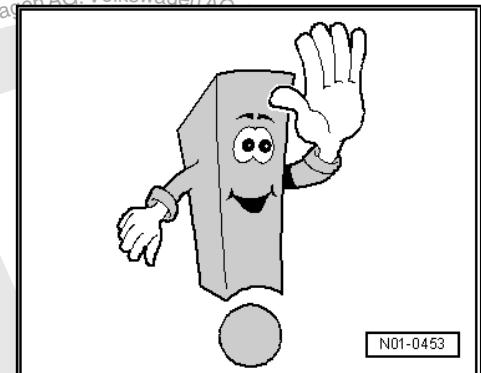


Rear axle, Front and AWD	Heavy duty suspension	Mexico, Russia	
Maximum permissible deviation from the running direction	maximum 20'	maximum 20'	
Standing height	400 ± 10 mm	390 ± 10 mm	

8.5 Procedure Overview for Vehicle Alignment

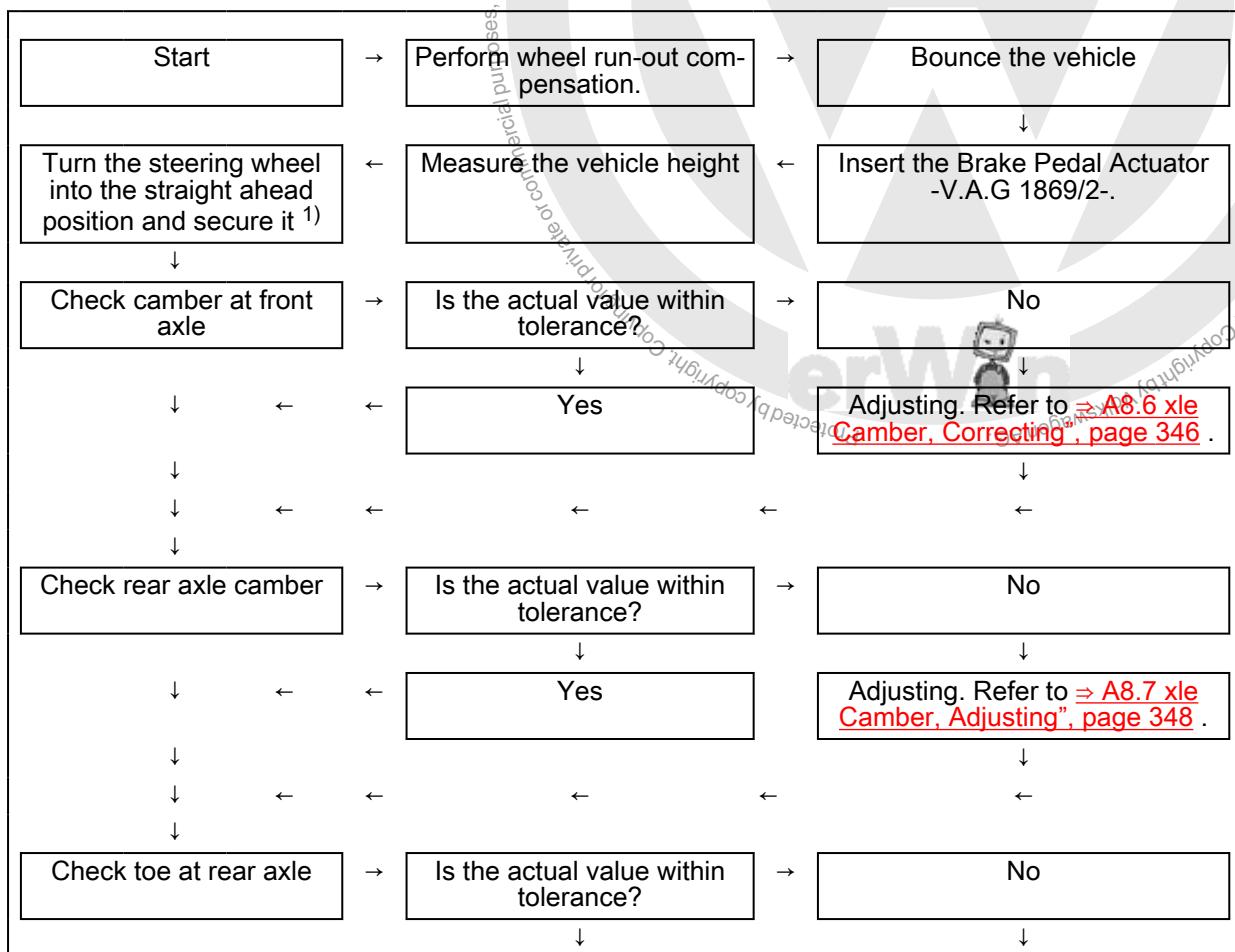
The following sequence of procedure steps must be observed.

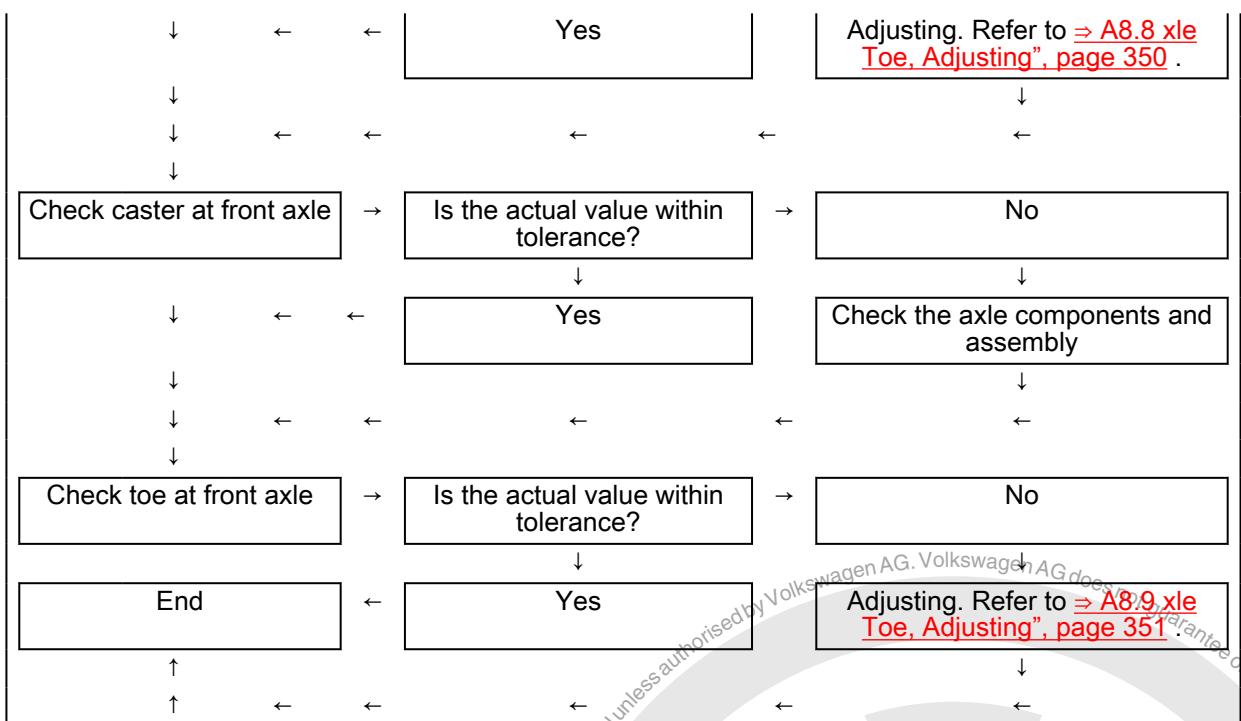
- Follow the instructions in the wheel alignment device.



N01-0453

Measuring procedure





¹⁾ If steering wheel is crooked at end of alignment procedure, it must be straightened. Perform a basic setting on the Steering Angle Sensor -G85- using the ⇒ Vehicle diagnostic tester.

8.6 Front Axle Camber, Correcting

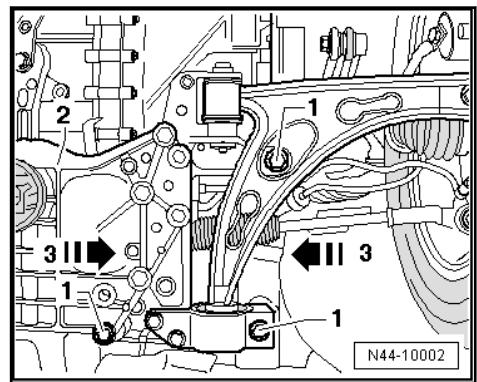
Special tools and workshop equipment required

- ◆ Torque Wrench, 40-200Nm -V.A.G 1332A-



Note

- ◆ *Correct the camber according to Body Collision only. Camber corrections are not possible. Moving the subframe can also adjust it.*
- ◆ *Slide subframe only toward left or right, under no circumstances in or against direction of travel!*
- Remove the noise insulation.
- Loosen bolts -1- for bracket mount/subframe on body on both sides.

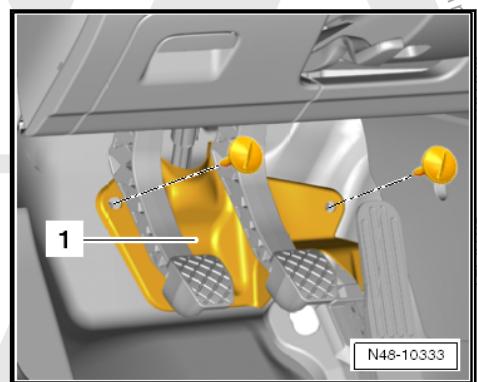


Adjusting the camber is limited by the subframe hole tolerances. If the specified value is not reached by moving the subframe, the subframe and the assembly must be checked. Refer to [L1 ist, Assessing the Suspension on Vehicles Involved in a Collision](#), page 1.

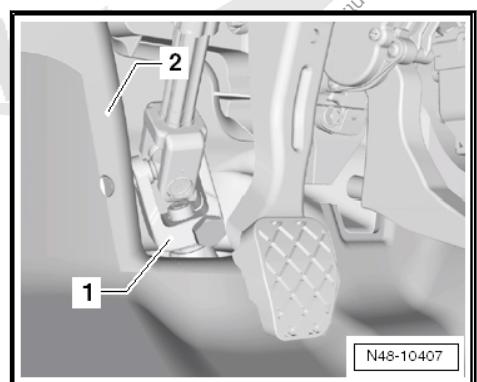
- By sliding subframe with bracket, specified value for camber can now be adjusted.
- Secure the subframe and brackets on the body with new bolts and tighten them to the additional specification.

After moving the subframe/steering gear, check the clearance between the steering column universal joint and the opening in the plenum chamber bulkhead.

- Remove the nuts -arrows- and remove the footwell trim panel -1-.



There must be at least 5 mm of free space all around between universal joint -1- and cutout of bulkhead -2-.





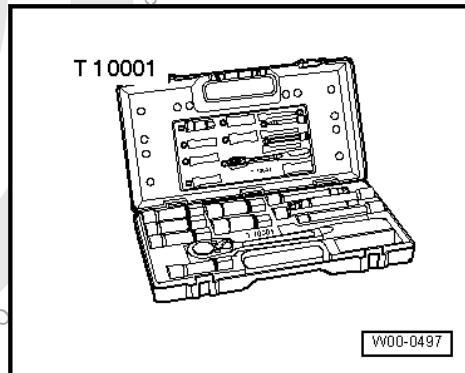
Tightening Specifications

Component	Tightening Specification
Subframe to body ◆ Different versions ◆ Allocation. Refer to the ⇒ Electronic Parts Catalog (ETKA). ◆ Use new bolts.	◆ M12 x 1.5 x 100: 70 Nm + 90° ◆ M12 x 1.5 x 110: 70 Nm
Bracket to body ◆ Use new bolts.	70 Nm + 90°
Mounting bracket to body ◆ Use new bolts.	70 Nm + 90°

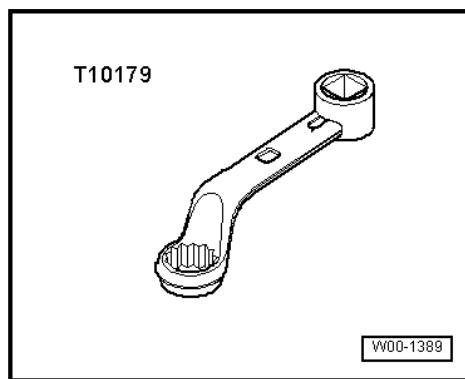
8.7 Rear Axle Camber, Adjusting

Special tools and workshop equipment required

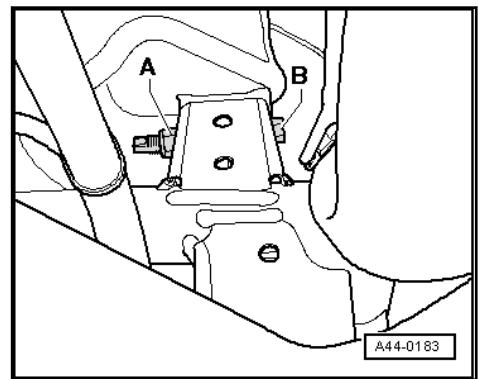
- ◆ Shock Absorber Set -T10001-



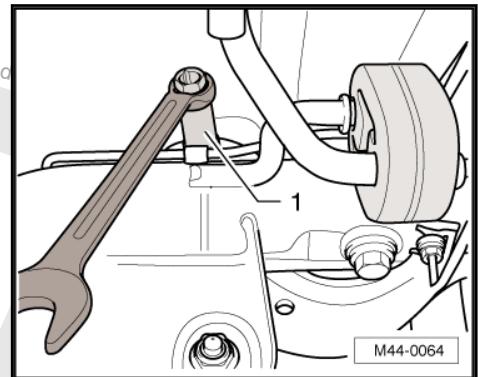
- ◆ Insert Tool - 18mm -T10179-



- Loosen the nut -A- of the threaded connection on the upper transverse link at subframe.



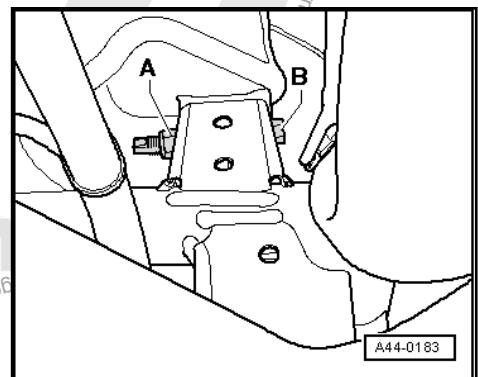
- Set the camber by turning the eccentric bolt -B- using the 18 mm socket from the Shock Absorber Set -T10001- -1-.



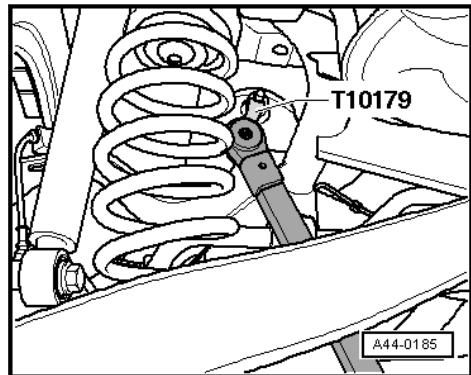
Note

The maximum adjustment range is 90° to left or right of center position.

- Tighten the nut -A-



- To do so, use the Insert Tool - 18mm -T10179-.



- After tightening the nut -A-, check the camber value again.

Tightening Specifications

Component	Tightening Specification
Upper transverse link to subframe (vehicles with FWD) ◆ Use a new nut ◆ Tighten bolts in curb weight position	95 Nm ◆ Adjust the Torque Wrench 40-200Nm -V.A.G 1332- to 80 Nm when tightening the nut ◆ Only applies in conjunction with Insert Tool SW 18 -T10179-.
Upper transverse link to subframe (vehicles with AWD) ◆ Use a new nut ◆ Tighten bolts in curb weight position	95 Nm ◆ Adjust the Torque Wrench 40-200Nm -V.A.G 1332- to 80 Nm when tightening the nut ◆ Only applies in conjunction with Insert Tool SW 18 -T10179-.

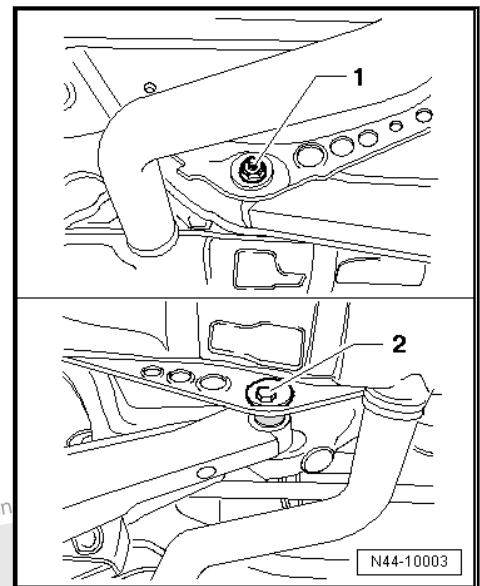
8.8 Rear Axle Toe, Adjusting

Special tools and workshop equipment required

- ◆ Torque Wrench, 40-200Nm -V.A.G 1332A-



Loosen the nut -1-.



- Turn eccentric bolt -2- until the specified value has been reached.
- Now tighten nut again.

Tightening Specification

Component	Tightening Specification
Lower transverse link to subframe <ul style="list-style-type: none"> ◆ Use a new nut ◆ Tighten bolts in curb weight position 	95 Nm

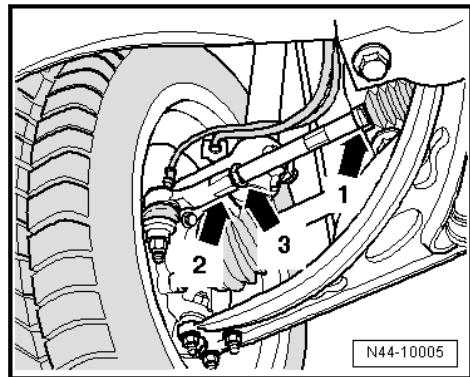
8.9 Front Axle Toe, Adjusting

Special tools and workshop equipment required

- ◆ Torque Wrench, 40-200Nm -V.A.G 1332A-



- ◆ Open Ring Wrench - 24mm -V.A.G 1332/11-
- Loosen the lock nut -arrow 3-, counterhold on tie rod end -arrow 2- while doing this.



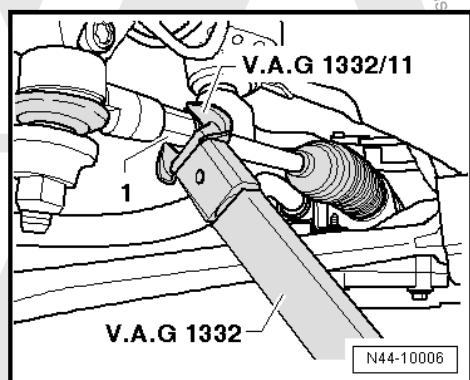
- Remove open spring clip -arrow 1- from the boot.
- Adjust the toe by turning the left and/or right tie rod.

For this purpose, an open-end wrench can be placed on hex head of tie rod.

Be sure that boots are not twisted after turning tie rods!

Twisted boots wear out quickly.

- Tighten lock nut with Open Ring Wrench - 24mm -V.A.G 1332/11- while counterholding tie rod end -1-.



- Check toe value again.

Setting may change slightly after lock nut is tightened.

However, if the measured toe value lies within the tolerance, the adjustment is correct.

- Install the spring clamp on the boot.

Tightening Specifications

Component	Tightening Specification
Tie rod end to tie rod	70 Nm

8.10 Basic Setting for Steering Angle Sensor -G85-

If steering wheel is offset, Basic Setting of Steering Angle Sensor -G85- must be checked! Perform a basic setting in Guided Fault Finding using ⇒ Vehicle diagnostic tester.

Use the **GO TO** in "function/component selection".



8.11 Vehicle Data Label

Explanation “PR number” on the vehicle data label

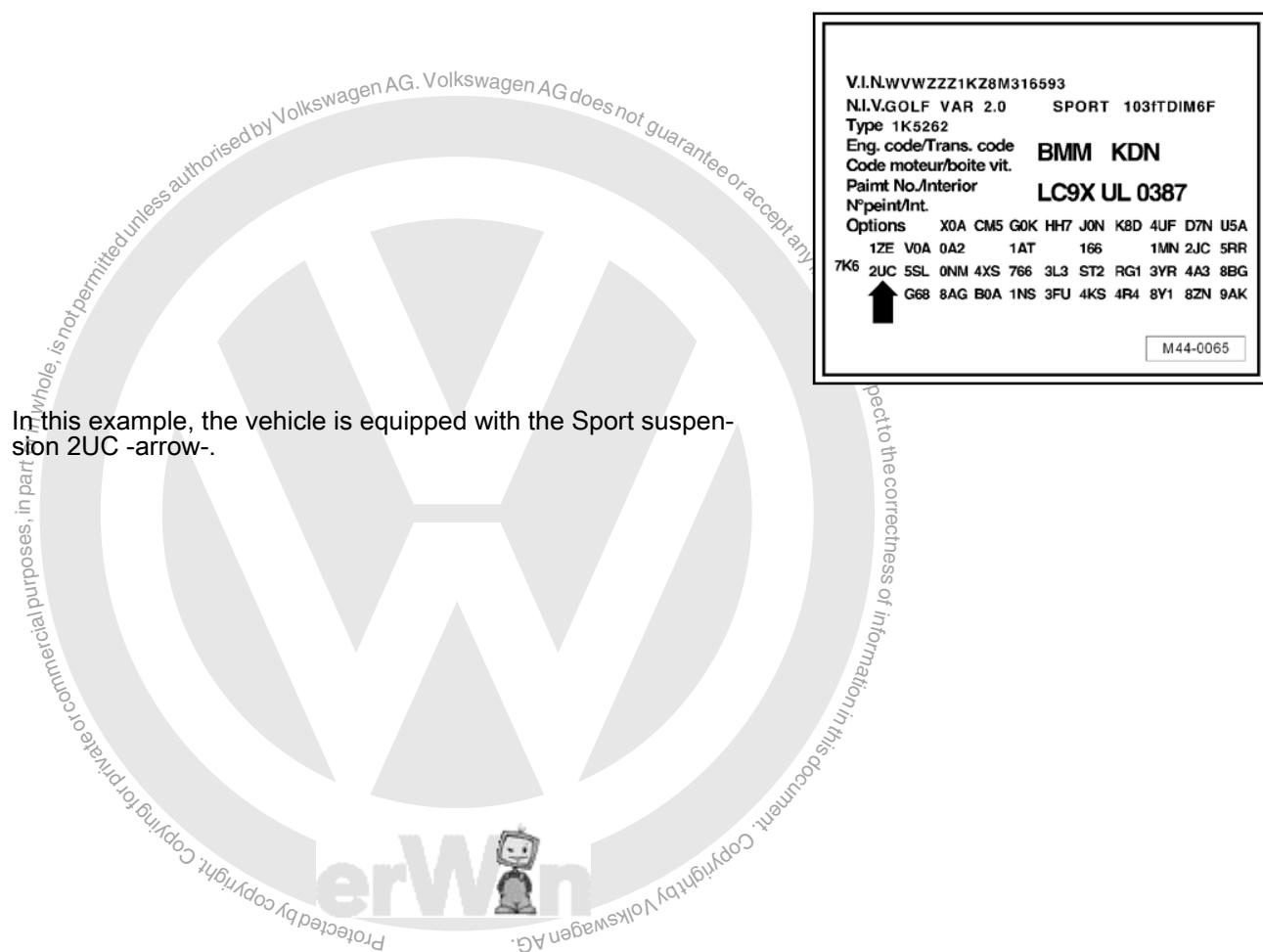
Depending on engine and equipment, various suspensions are installed. They are identified by the PR numbers.

The PR numbers are needed for the allocation of vehicle specified values.

Which suspension version is installed in the vehicle is indicated on vehicle data plate by corresponding PR number for the front axle.

The vehicle data label can be found in the spare wheel well as well as in the Maintenance booklet.

Sample Vehicle Data Label





9 Wheels and Tires

⇒ [w9.1 with Tire Mobility Kit", page 354](#)

⇒ [S9.2 sealant", page 354](#)

⇒ [R9.3 removing", page 354](#)

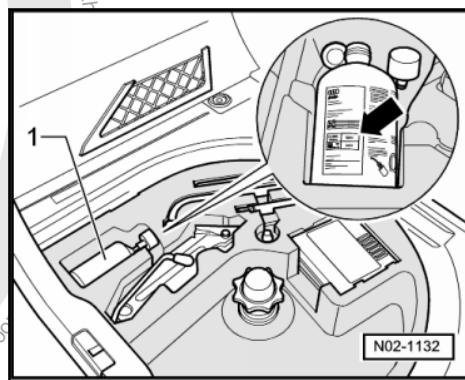
⇒ [M9.4 mounting", page 355](#)

⇒ [S9.5 sealant, Disposing", page 356](#)

9.1 Vehicles with Tire Mobility Kit

Vehicles are equipped with either a spare wheel or a breakdown kit, depending on equipment.

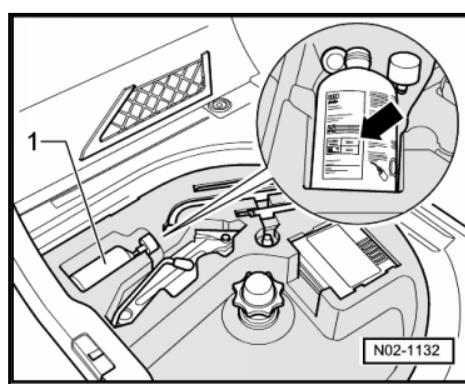
The wheel repair kit is located in the luggage compartment, where the spare tire would be stored if the vehicle was equipped with one. The kit contains a compressor and a bottle of tire sealant -1-.



9.2 Tire Sealant

Tire sealant in the bottle has a limited storage life.

Therefore the minimum shelf life date -arrow- is marked on the bottle -1-.



Replace the tire sealant when minimum shelf life date has been reached (tire sealant must not be older than 4 years).

If the bottle was opened, for example for a flat tire, it must also be replaced.

Follow all waste disposal regulations.

9.3 Tires, Removing

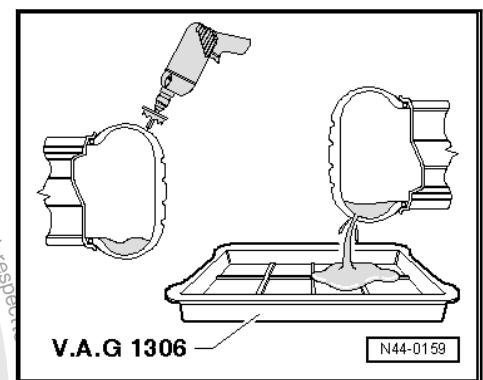
Tires which have been filled or sealed with tire sealant, must be drained before removing from wheel.



WARNING

- ◆ Prevent tire sealant from making contact with eyes and skin.
- ◆ It is harmful to health, can cause eye irritation and allergies.
- ◆ Wear protective gloves and glasses when removing tires.

- Set wheel on an even surface.
- Remove tire valve insert.
- Carefully drill hole in tire in area of shoulder using suitable drill or cutter.

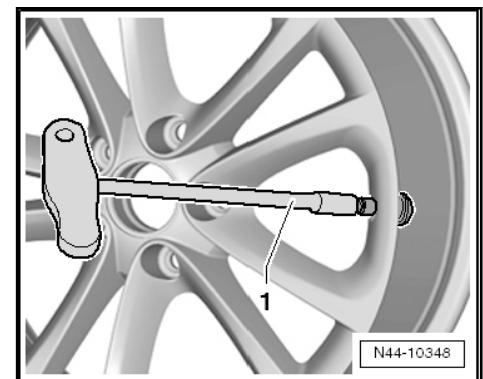


- Hold wheel over drip tray and allow tire sealant to drain.
- Remove tire from rim.
- Clean wheel rim, for example using a damp cloth.

9.4 Tires, Mounting

- Make sure wheel rim is clean.

Using the Valve Fitting Tool -VAS 6459- -1-, install a new tire valve.



- Remove the valve insert.
- Inflate the tire to approximately 3...4 bar (58.02 psi). The bead of the tire must audibly slide over the hump in the rim.
- Install valve insert.
- Correct inflation pressure to the specified pressure.
- Balance wheel.



9.5 Tire Sealant, Disposing

- ◆ Tire sealant or residue from it must not be mixed with other wastes/fluids
- ◆ Accumulating fluid residue from tire sealant must be collected and placed in a plastic container. The plastic containers can be sent for recycling together with the tire mobility kits (if the expiration date has passed).
- ◆ The return or recycling can take place using the existing workshop disposal systems
- ◆ Contact the service provider or ask the disposal contractor used by the distribution center or importer.





10 Wheel, Changing and Mounting

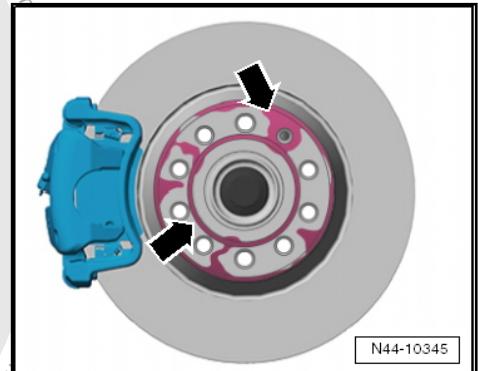
⇒ M10.1 **ounting", page 358**



WARNING

The secure seating of the wheel bolts and the wheels is only ensured if the instructions and checks below are followed.

- Make sure the contact surfaces -arrows- on the brake rotor are free of corrosion and dirt.



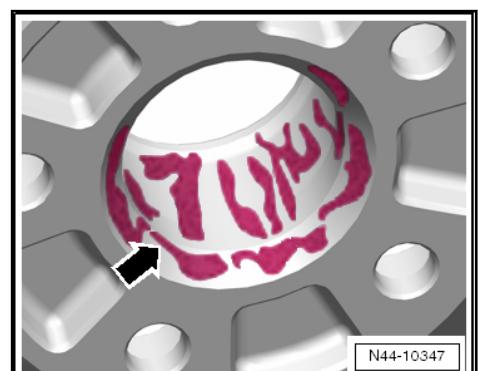
N44-10345

- Make sure the contact surfaces -arrow- on the brake rotor center seat are free of corrosion and dirt.



N44-10346

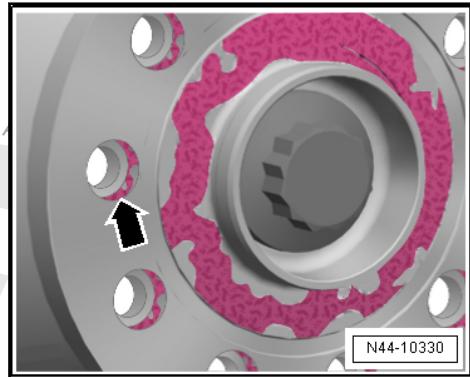
- Make sure the contact surface -arrow- on the wheel inner side (rim) as well as the central seat in the rim is free of corrosion and dirt.



N44-10347



- The spherical caps * in the wheel bolt openings and the wheel bolt threads must likewise be free of corrosion, dirt, oil or grease.
- * The spherical cap is the curved surface of a section of a sphere.
- Check whether the wheel bolts can be easily screwed in by hand. The threads of the wheel bolts must not touch the holes in the brake rotor -arrow-.



If the thread of the wheel bolt touches the hole -arrow-, turn the brake rotor accordingly.

If necessary, clean any dirt and corrosion, oil or grease off the surfaces and thread in the wheel hub and/or wheel bolts.

The wheel caps (rims) and the wheel bolts must be free of dirt and corrosion.

- Clean dirty wheel caps (rims) with a lint-free cloth.
- Check the wheel bolts and wheel hub threads for cleanliness.
- Clean dirty wheel bolts in the area of the wheel cap and threads, for example using a brass brush.

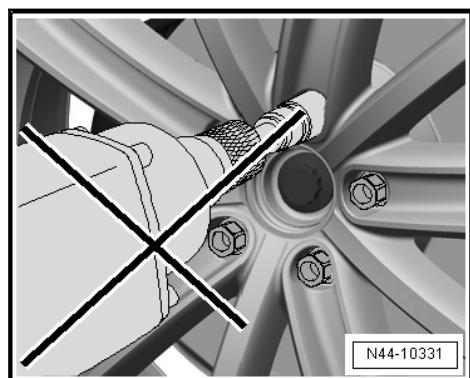


WARNING

Heavily corroded, difficult to turn or damaged wheel bolts must be replaced.

10.1 Wheel, Mounting

- Coat the wheel centering seat with corrosion protection. Refer to [C11 entering Seat, Protecting against Corrosion](#), page 360 .





- 1 - When mounting a wheel, tighten all wheel bolts uniformly by hand.
- 2 - Tighten the wheel bolts diagonally to 30 Nm.
- 3 - Lower the vehicle to the floor and tighten diagonally all the wheel bolts with the wrench to the specified wheel bolt tightening specification. Refer to [» M2 Counting Tightening Specifications](#), page 315 .

**WARNING**

Never use an impact wrench to install the wheel bolts!

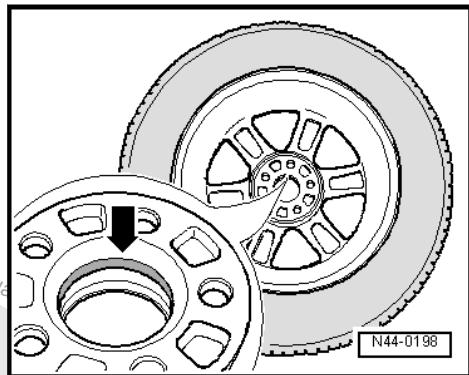


11 Wheel Centering Seat, Protecting against Corrosion

Applies to light-alloy and steel wheels

When a wheel is changed, the centering seat should be sprayed with Wax Spray to prevent corrosion between the centering seat and the wheel rim. Refer to the ⇒ Electronic Parts Catalog (ETKA).

- Remove the wheel.
- Thoroughly clean the centering seat on the wheel hub and the centering surface on the rim.
- Apply wax in area of centering -arrow- using a brush.



Always make sure that only centering -arrow- is waxed and not rim contact surfaces. As a consequence, the brakes would become contaminated while driving and thereby result in poor braking.



WARNING

Wheel bolts, contact surfaces of wheel/wheel hub and the threads in the wheel hubs must not have wax applied to them. Never apply lubricants or anti-corrosion treatment to threads in wheel hubs.

- Install the wheel and tighten. Refer to ⇒ [M2 Counting Tightening Specifications](#), page 315 .





12 Wheel/Tire Vibration, Causes and Solution

⇒ [C12.1 causes", page 361](#)

⇒ [12.2 , page 361](#)

⇒ [T12.3 est, Performing Before Balancing", page 362](#)

⇒ [B12.4 alancing Machine", page 362](#)

⇒ [H12.5 unter RFT33VAG Road Force Touch™ Wheel BalancerVAS 6230B4 ", page 364](#)

⇒ [F12.6 ine Balancing Machine \(Finish Balancer\) ", page 365](#)

⇒ [a12.7 nd Wheel Radial and Lateral Run-Out", page 366](#)

⇒ [a12.8 nd Tires, Checking Radial and Lateral Run-Out with Tire Dial GaugeV.A.G 1435 ", page 367](#)

⇒ [W12.9 heel, Checking Radial and Lateral Run Out", page 368](#)

⇒ [12.10 , page 369](#)

⇒ [S12.11 pots in Tires From Standing", page 370](#)

12.1 Vibration Causes

There are many causes for vibration. Vibration can also be caused by tire wear, among other things. Tire wear caused by driving does not always develop evenly over the entire tread. Due to this, a slight imbalance develops which disturbs the smoothness of the formerly accurately balanced wheel.

This slight imbalance cannot yet be felt in the steering wheel, but it is present. It increases the tire wear and consequently reduces the service life of the tire.

Recommendation

In order to guarantee over the entire service life of a tire

- optimal safety,
- optimal smoothness and
- uniform wear

it is recommended that wheels/tires be balanced at least two times within the tire service life.

12.2 Balancing

Before beginning balancing, the following requirements must be fulfilled:

- The tire pressure must be OK.
- The tire tread must not be worn down on one side and should be at least 4 mm deep.
- The tires must not have any damage such as cuts, holes, foreign bodies, etc.
- The suspension, steering, tie rods and damper must be in proper working order.
- A road test has been performed.



12.3 Road Test, Performing Before Balancing

If a vehicle comes to the workshop with the complaint "vibration", a road test must be performed before balancing the wheels.

- ◆ That way, information about the type of vibration can be obtained.
- ◆ Observe at which speed range the disturbance takes place.
- Raise the vehicle on the platform immediately after the road test.
- Mark the installation position on the tire.

Component location of tire	Identification with ...
Left front tire	LF
Right front tire	RF
Left rear tire	LR
Right rear tire	RR

- Remove wheels from vehicle.
- Balance the wheels.

12.4 Stationary Balancing Machine

- Test drive performed. Refer to ⇒ [T12.3 est, Performing Before Balancing](#), page 362 .

Tension the wheel on balancing machine



Please keep in mind that cleanliness is extremely important when balancing, as it is when performing any other repair work. Only then can a proper result be obtained!

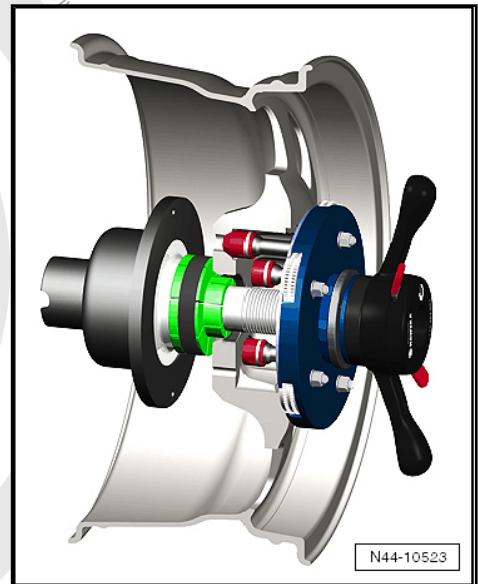
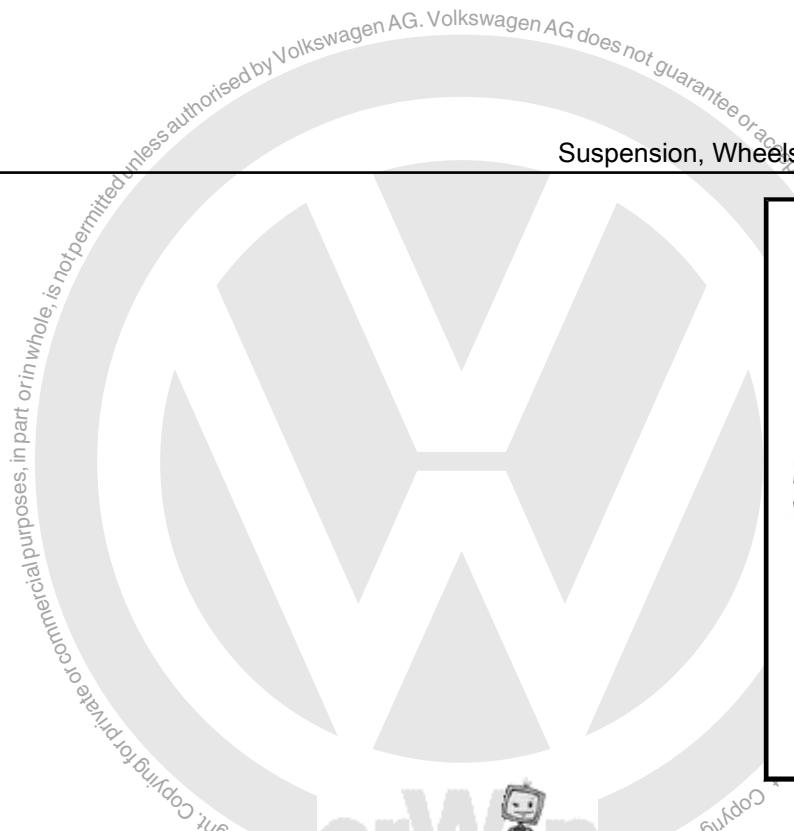
Dirt and rust in the area of the contact surfaces and centering of the wheel distort the result.

- Clean the contact surfaces, centering seat and wheel disc using the Pneumatic Brush Grinder Set -VAS 6446- before tensioning wheel on balancing machine! Refer to ⇒ Volkswagen ServiceNet; Workshop Equipment, Catalog.



It is very important that the wheel balancing machine uses the correct system for centering and tensioning the tires when replacing them. Reference the information for the Wheel Balancing Machine Centering System before beginning any work. Refer to ⇒ Volkswagen ServiceNet; Workshop Equipment, Catalog.

- Tension the wheel with the tire on the balancing machine.

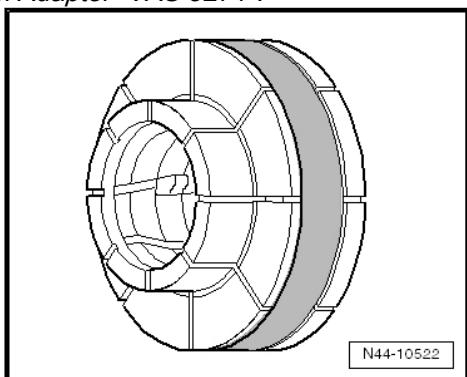


N44-10523



Note

To mount the wheel on the wheel balancer, use for example
 Wheel Centering System Adapter -VAS 5271-.



N44-10522

- ◆ This way a 100% centering of the wheel and gentle tensioning is possible!
- ◆ It is not possible to center it 100% on balancing machine with conical tensioners.
- ◆ With a deviation of 0.1 mm outside the center, there is an imbalance of 10 grams on the wheel/tire.

Wheel/tire balancing procedure

- Let the wheel/tire turn on the balancing machine.
- Check the run of the characteristic curves on the sidewall of the tire in the area of the rim flange.
- Check the tire wear pattern while the wheel/tire is turning.



Note

In the event of one-sided wear, wear spots from braking or severe flattening, smooth running cannot be achieved by balancing. In this case, the tire must be replaced.



- Check the run-out on the wheel/tire. If the wheel with tire runs untrue, although there are no flat spots, a radial run-out or lateral run-out may be the cause.
- Check the wheel with tire for radial and lateral run-out. Refer to [⇒ a12.8 nd Tires, Checking Radial and Lateral Run-Out with Tire Dial GaugeV.A.G 1435 ", page 367 .](#)
- If the radial and lateral run-out are within the specified tolerance, balance the wheel and tire.



Note

- ◆ *Do not use more than 60 grams of weight per wheel.*
- ◆ *If more weight is necessary, a smoother running can be achieved by matched mounting of the tire. Matched mounting of tire. Refer to [⇒ 12.10 , page 369 .](#)*
- ◆ *The display in the balancing machine should show 0 grams.*
- ◆ *Hunter RFT33VAG Road Force Touch™ Wheel Balancer VAS 6230B4- can be inserted as an alternative to matching. Refer to [⇒ H12.5 unter RFT33VAG Road Force Touch™ Wheel BalancerVAS 6230B4 ", page 364 .](#)*

- Install the wheel on the vehicle.
- First, tighten the lowest wheel bolt hand-tight to approximately 30 Nm.
- Tighten the remaining wheel bolts diagonally to approximately 30 Nm. This process centers the wheel on the wheel hub.
- Lower the vehicle onto its wheels.
- Now use a torque wrench to tighten the wheel bolts diagonally to the specified tightening specification.

Road Test, Performing

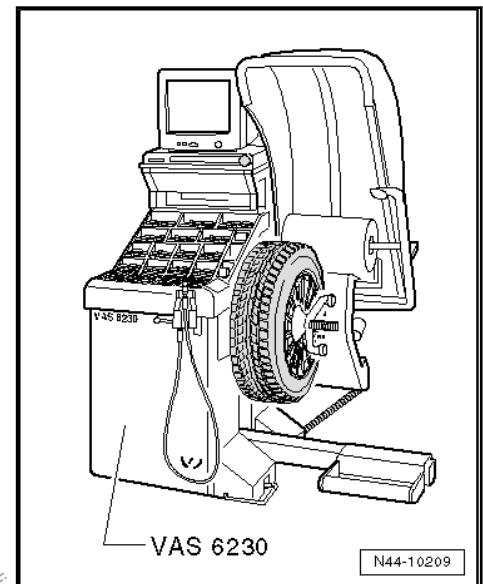
- Perform a road test after balancing the wheel/tires.

If a vibration is still detected during the road test, the cause may be due to tolerance in the wheel centering.

The component tolerances of wheels and wheel hubs can be additive in unfavorable cases. Vibration can result from this. This can be eliminated using a finish balancer. Refer to [⇒ F12.6 ine Balancing Machine \(Finish Balancer\) ", page 365 .](#)

12.5 Hunter RFT33VAG Road Force Touch™ Wheel Balancer -VAS 6230B4-

Expanded functions can be performed using Hunter RFT33VAG Road Force Touch™ Wheel Balancer -VAS 6230 B4- in addition to the previously known balancers.



A special characteristic of this system is testing the radial force of wheel/tire during rolling.

For this purpose, a roller presses a force of approximately 635 kg (1,399.93 lbs) against the wheel. This simulates the tire contact force against the road surface while driving.

Tire contact forces fluctuate due to radial and lateral run-out and differing stiffness in the tires.

The -VAS 6230 B4- detects and stores the position of the maximum measured radial force in the tires. After that, the position of smallest dimension between rim flange and disc wheel center is measured.

12.6 Fine Balancing Machine (Finish Balancer)



Note

- ◆ Manufacturer instructions for the balancer are required when working with a fine balancing machine.
- ◆ For the balancing, the wheels of the tractive axle are set upon the turntable sensors, for example, front wheels for FWD (FWD) and all 4 wheels for AWD (AWD).

If it is determined when balancing on the vehicle the residual imbalance is more than 20 grams, the wheel should be rotated on the wheel hub.

- Mark the point at which the imbalance is indicated.
- Afterwards, unbolt the wheel and rotate its position on the wheel hub so that the marking points downward.



Note

The wheel hub must not turn during this procedure.

- First, tighten the lowest wheel bolt by hand to approximately 30 Nm.



- Now tighten the remaining wheel bolts diagonally also to about 30 Nm. This process centers the wheel properly on the wheel hub.
- Check again whether the imbalance is less than 20 grams using the finish balancer.



Note

The imbalance should not be smaller than 20 grams under any circumstances before changing balance weight.

- Remove the wheel bolts again if necessary.
- Rotate the wheel relative to the wheel hub once more by one or two wheel bolt holes.
- Tighten the wheels using the method described above.



Note

The imbalance should only be reduced by changing balance weight if the imbalance is less than 20 grams.

- Balance the wheels until the imbalance is below five grams.
- Tighten the wheel bolts to the specified tightening specification if not already done.



WARNING

Always tighten the wheel bolts to the specified tightening specification with a torque wrench.

12.7 Tire and Wheel Radial and Lateral Run-Out

Radial and lateral run-out occur when the wheel and tire are not running precisely true.

For technical reasons, 100% true running is not possible.

Therefore the manufacturers of these components allow a precisely specified tolerance.

Mounting the tire in an unfavorable position on the wheel can be the cause for exceeding the maximum allowed tolerance for wheel with tire.

The table shows the maximum permissible tolerance values for the wheel with mounted tire.

Tolerances for radial and lateral run-out of disc wheel with tire

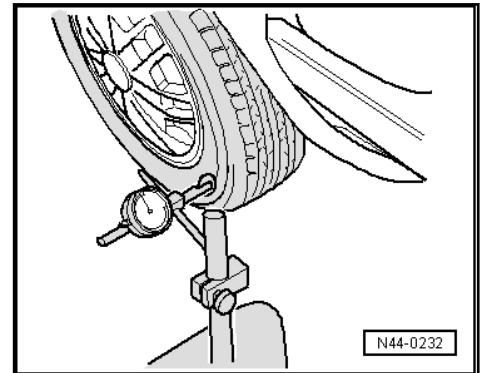
Wheel with tire	Radial run-out (mm)	Lateral run-out (mm)
Passenger Vehicle	0.9	1.1 (1.3 near the lettering)



12.8 Wheels and Tires, Checking Radial and Lateral Run-Out with Tire Dial Gauge -V.A.G 1435-

Checking lateral run-out

- Load the Tire Dial Gauge approximately 2 mm.
- Set up Tire Dial Gauge on the side wall of the tire.



- Slowly rotate the wheel.
- Note the smallest and the largest dial readings.



Note

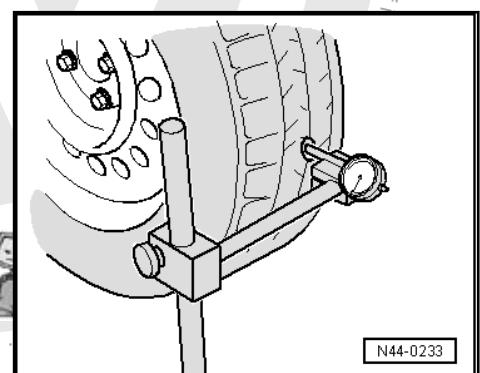
If the difference is greater than 1.3 mm, the lateral run-out is too great.

In this case, lateral run-out can be reduced by matched mounting of the tire. Refer to [⇒ 12.10 , page 369](#).

Peak values on the Tire Pressure Gauge due to small irregularities in the rubber may be disregarded.

Checking radial run-out

- Load the Tire Dial Gauge approximately 2 mm.
- Set up Tire Dial Gauge on the tire tread.



- Slowly rotate the wheel.
- Note the smallest and the largest dial readings.



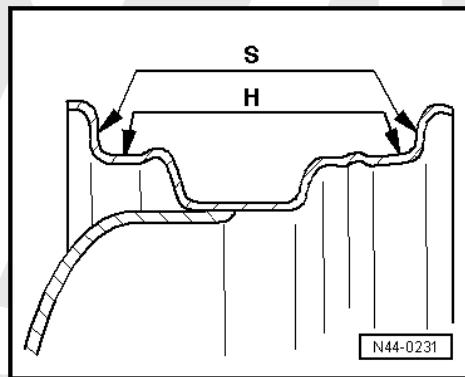
Note

If the difference is greater than 1 mm, the radial run-out is too great.

In this case, radial run-out can be reduced by matched mounting of the tire. Refer to [⇒ 12.10 , page 369](#).

12.9 Disc Wheel, Checking Radial and Lateral Run Out

- Mount the disc wheel on the Wheel Balancer.
- Use the Wheel Centering System Adapter -VAS 5271-.
- Load the Tire Dial Gauge approximately 2 mm.
- Slowly turn the disc wheel.
- Note the smallest and the largest dial readings.



S - Lateral Run-Out

H - Radial Run-Out

- Compare determined value with specifications in the table [⇒ page 368](#).

Note

Peak values on the Tire Dial Gauge due to small irregularities may be disregarded.

Specifications for radial and lateral run-out on disc wheel

Disc Wheel	Radial run-out (mm)	Lateral run-out (mm)
Steel wheel	0.5	0.5
Light alloy wheel	0.5	0.8

Note

If the measured value exceeds the specified value, no acceptable smooth running can be attained.



12.10 Matching

General Information

If radial or lateral run-out from wheel or tire meet each other, the untrue running of the wheel and tire is increased.

For technical reasons, 100% true running is not possible. Refer to [⇒ a12.7 nd Wheel Radial and Lateral Run-Out", page 366](#).

Drive the tires until they are warm before matching them to the tires already on the vehicle. This eliminates flat spots from standing which may exist. Refer to [⇒ S12.11 pots in Tires From Standing", page 370](#).

Work procedure for match-mounting

- Let the air out of the tire.
- Press the tire beads off the rim flanges.
- Coat the tire beads all around with tire mounting paste.
- Rotate the tire 180° relative to the disc wheel.
- Inflate the tire to approximately 4 bar (58.02 psi).
- Tension wheel with tire on balancing machine.
- Check the run-out or the radial and lateral run-out, as necessary.



Note

- ◆ If the radial and lateral run-out value is not exceeded, the wheel can be balanced to 0 grams. Specifications are found on [⇒ page 366](#).
- ◆ If the radial and lateral run-out lies outside the specified values, the tire must be turned again.

- Let the air out of the tire and press the tire beads off the rim flanges.
- Rotate the tire 90° (one quarter turn) relative to the disc wheel.
- Inflate the tire to 4 bar (58.02 psi) and check for true running.



Note

- ◆ If the radial and lateral run-out value is not exceeded, the wheel can be balanced to 0 grams.
- ◆ If the radial and lateral run-out is still outside the specified values, the wheel must be turned again.

- Press the tire beads off the rim flanges.
- Rotate the tire 180° (one half turn) relative to the disc wheel.

If the values for radial or lateral run-out are still outside the specified values, check the wheel for radial and lateral run-out. Refer to [⇒ W12.9 heel, Checking Radial and Lateral Run Out", page 368](#).

If the measured values for radial and lateral run-out of the wheel disc are within the specified values, then the tire has excessive radial or lateral run-out. In this case, the tire must be replaced.



Note

- ◆ Assembly paste from mounting tires is located between tires and rim flanges.
- ◆ Avoid strong braking or acceleration maneuvers during the first 100 to 200 km (62.1 to 124.3 miles). Otherwise, the tires can rotate on the rims and the work done would then be undone!

12.11 Flat Spots in Tires From Standing

What is a flat spot from standing?

Terms like flat portion, flattening, are also used as a term for flat spots from standing.

Flat spots from standing cause vibration, like an incorrectly balanced wheel. It is important to recognize a flat spot in the tread from standing as such!

Flat spots from standing cannot be corrected by balancing, and can occur again at any time under various circumstances. Flat spots from standing can be corrected without complicated special tools. Provided that the flat spot was not caused by wheel lock during hard braking. Refer to ⇒ Wheel and Tire Guide; Rep. Gr. 44; Tires, Rolling Noises, Wear Spots.

Note

Wear spots due to wheel lock are irreparable! Tires with such damage must be replaced.

Causes of flat spots from standing:

- ◆ The vehicle stands for several weeks in a location without being moved.
- ◆ Tire pressure is too low.
- ◆ The vehicle was placed in a paint system drying cabinet after painting.
- ◆ The vehicle was parked with warm tires in a cold garage or similar for a long time. In this case, a flat spot can develop overnight.

Flat spots, correcting

- ◆ Flat spots cannot be removed from tires with workshop equipment.
- ◆ Such flat spots can be "driven out" only by driving the car until the tires are warm.
- ◆ We do not recommend the following method during cold or winter weather.

Requirements/Conditions

- Check and correct the tire pressure as necessary.
- Drive the vehicle on the highway, if possible.
- If the traffic and road conditions permit, drive at a speed of 120 km/h to 150 km/h (74.6 mph to 93.2 mph) for a distance of 20 to 30 km (12.4 to 18.6 miles).



WARNING

- ◆ *Do not endanger anyone during this road test.*
- ◆ *Observe valid traffic laws and speed limits during the road test!*

- Raise the vehicle immediately after the drive.
- Remove wheels from vehicle.
- Balance the wheels on the stationary balancing machine.
Refer to [⇒ B12.4 balancing Machine](#), page 362 .





48 – Steering

1 Vehicles Involved in Collisions, Evaluating

For a check list for assessing the suspension on vehicles involved in a collision, Refer to [⇒ L1 ist, Assessing the Suspension on Vehicles Involved in a Collision](#), page 1 .





2 General Repair Information

- ⇒ [G2.1 ear", page 373](#)
- ⇒ [a2.2 nd Gaskets", page 373](#)
- ⇒ [a2.3 nd Nuts", page 373](#)
- ⇒ [C2.4 omponents", page 374](#)
- ⇒ [F2.5 ault Finding, OBD and Test Instruments", page 374](#)

The maximum possible care, cleanliness and proper tools are essential to ensure satisfactory and successful steering gear repairs. Of course the general safety precautions also apply when carrying out repair work.

General information that applies to various different repair procedures is listed here instead of repeating it multiple times throughout the manual. They apply to this repair manual.

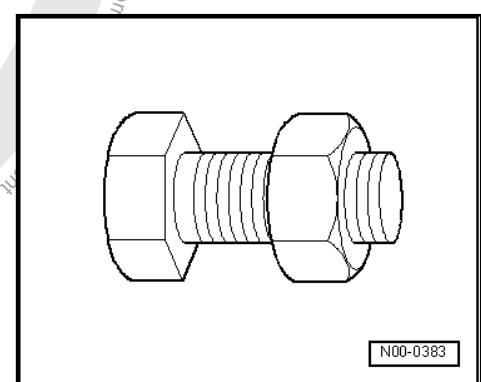
2.1 Steering Gear

- ◆ Always clean the connection points and the area around them and then loosen them.
- ◆ When installing the steering gear, make sure the alignment sleeves are correctly positioned between the bracket and steering gear.
- ◆ Place removed parts on a clean surface and cover them so that they do not get dirty. Use foil and paper. Only use lint-free cloths.
- ◆ Only install clean parts: remove the replacement parts from their packaging just before installing them.
- ◆ Only use lubricants and sealants marked with part numbers.
- ◆ Carefully cover or seal opened components if the repair is not performed immediately.

2.2 Seals and Gaskets

- ◆ Always replace seals and gaskets.
- ◆ After removing seals, inspect the contact surfaces on housings and shafts for burrs and damage and repair if necessary.
- ◆ Remove all sealant residue of fluid seals from the sealing surfaces. Sealant residue must not enter the steering gear housing when doing this.

2.3 Bolts and Nuts



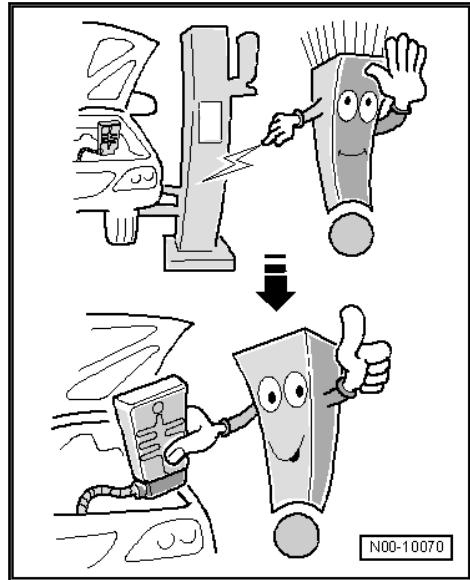
- ◆ Loosen and tighten the bolts and nuts for securing the covers and housings in a diagonal sequence.



- ◆ Do not cant but loosen and tighten especially sensitive parts in diagonal manner in stages, for example servo motor with control module.
- ◆ The tightening specifications given apply to non-lubricated bolts and nuts.
- ◆ Always replace self-locking nuts and bolts.

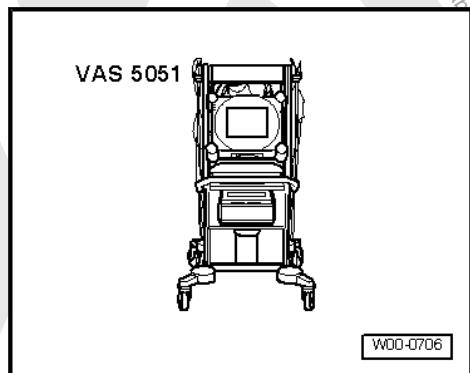
2.4 Electrical Components

It is safe to assume that everyone has been shocked at one time or another when coming into contact with a metal object. The reason for this is the build-up of static electricity in the human body. This charge can cause malfunctions when contacting the electrical components for the steering gear.



- Touch a grounded object, such as a water line or a hoist, before working on electrical components. Do not make direct contact with the connector terminals.

2.5 Guided Fault Finding, OBD and Test Instruments



- ◆ Before performing repairs on the electro-mechanical steering gear, determine the cause of the damage as accurately as possible using the ⇒ Vehicle diagnostic tester in the "Guided Fault Finding", "Vehicle Self-Diagnosis" and "Measurement" modes.



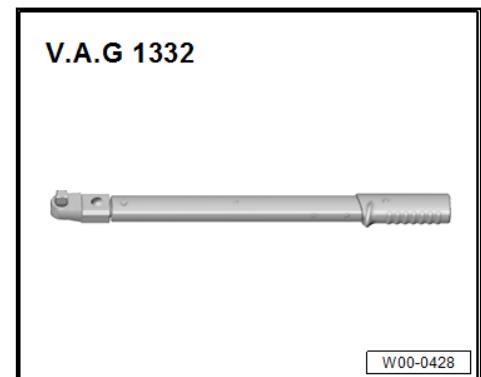
3 Steering Wheel, Steering Column

- ⇒ [W3.1 heel, Removing and Installing", page 375](#)
- ⇒ [-3.2 Steering Column, LHD, Vehicles without Knee Airbag", page 378](#)
- ⇒ [C3.3 column, Removing and Installing, LHD, Vehicles without Knee Airbag", page 378](#)
- ⇒ [-3.4 Steering Column, LHD, Vehicles with Knee Airbag", page 389](#)
- ⇒ [C3.5 column, Removing and Installing, LHD, Vehicles with Knee Airbag", page 389](#)
- ⇒ [C3.8 column, Handling and Transporting", page 410](#)
- ⇒ [C3.9 column, Checking for Damage", page 412](#)

3.1 Steering Wheel, Removing and Installing

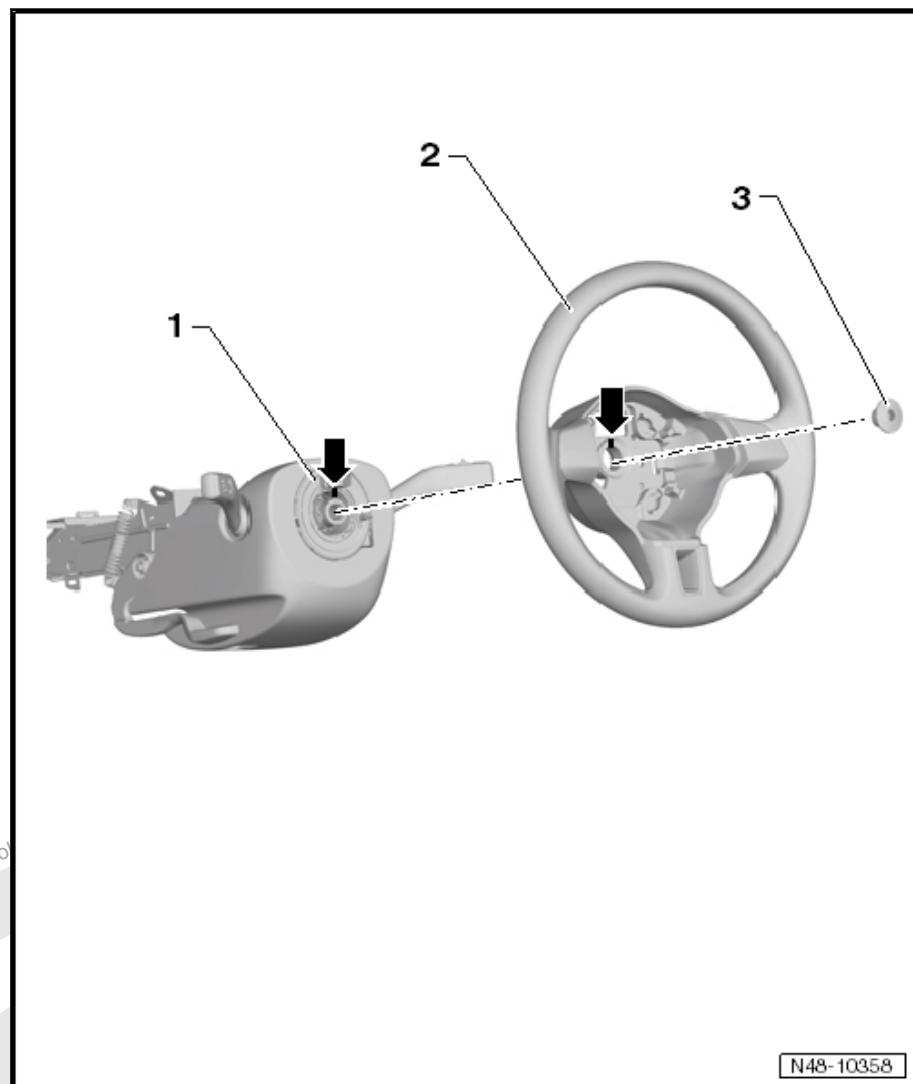
Special tools and workshop equipment required

- ◆ Torque Wrench, 40-200Nm -V.A.G 1332A-



Removing

- Remove driver side airbag unit. Refer to ⇒ Rep. Gr. 69; Airbag; Driver Side Airbag Unit, Removing and Installing.
- Turn steering wheel into center position (wheels in straight ahead position).



N48-10358

- Remove the bolt -3- and remove the steering wheel -2- from the steering column.

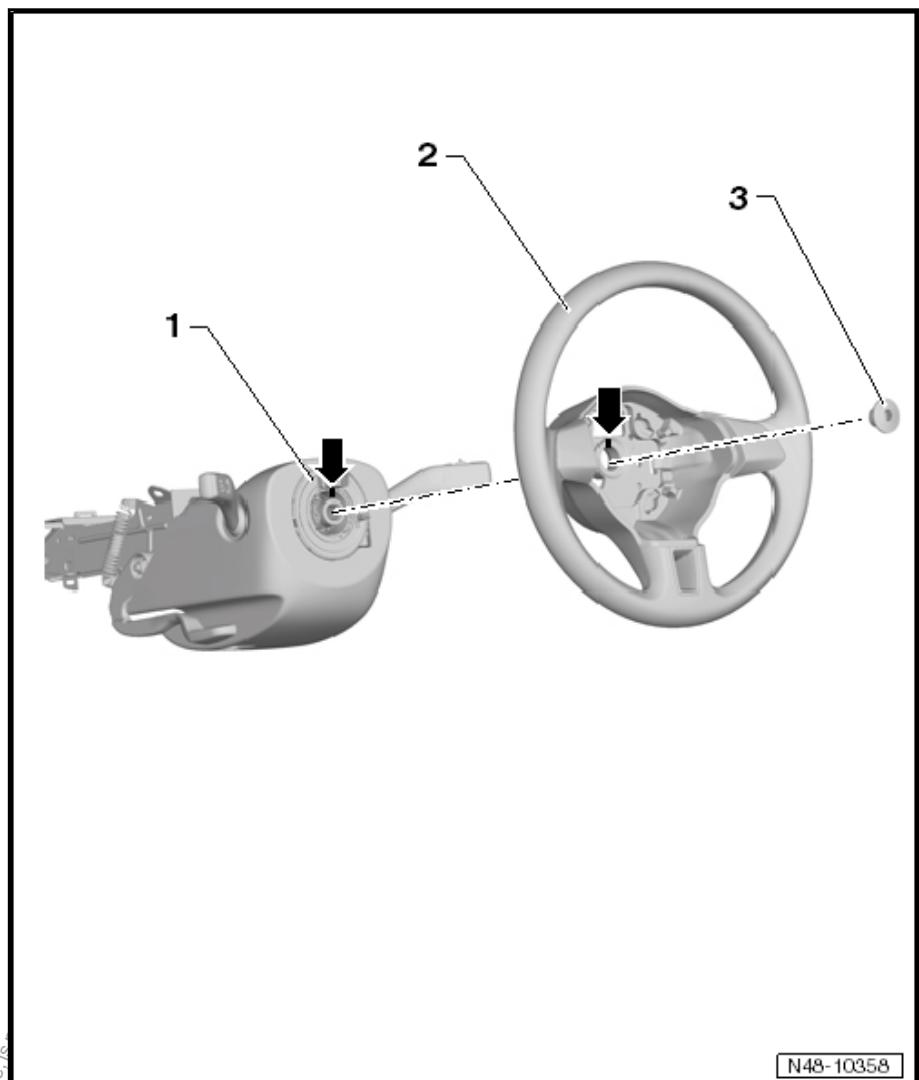
Installing

- Place the steering wheel -2- on the steering column.
- Center markings for steering wheel and steering column -arrows- must align.

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- Guide the connector terminal for the Steering Angle Sensor -G85- -1- into the opening in the steering wheel base.
- Secure steering wheel with bolt -3-.
- Install the driver side airbag unit. Refer to ⇒ Rep. Gr. 69; Airbag; Driver Side Airbag Unit, Removing and Installing.

Tightening Specification

Component	Tightening Specification
Steering wheel to steering column ◆ Always replace screw.	30 Nm + 90° additional turn



3.2 Overview - Steering Column, LHD, Vehicles without Knee Airbag



Note

- ◆ Welding and alignment work on suspension components that are supporting or control the wheels is not permitted.
- ◆ Always replace self-locking nuts.
- ◆ Always replace corroded bolts/nuts.

1 - Assembly carrier with mounting bracket

2 - Steering Column

- Removing and Installing. Refer to [C3.3 column, Removing and Installing, LHD, Vehicles without Knee Airbag](#), page 378 .

3 - Brake Pedal Crash Brace

- Allocation. Refer to the [Electronic Parts Catalog \(ETKA\)](#).

4 - Bolt

- 20 Nm
- Observe the tightening sequence. Refer to [page 386](#).

5 - Bolt

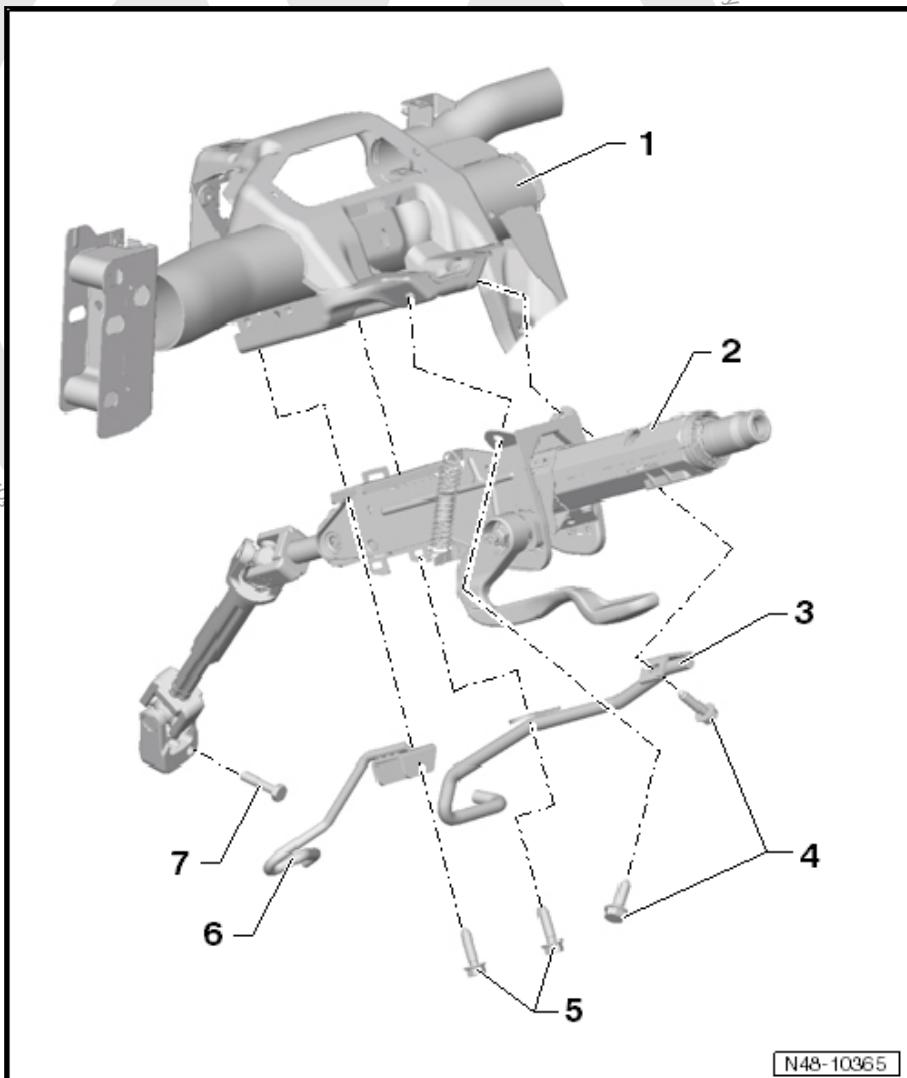
- 20 Nm
- Observe the tightening sequence. Refer to [page 386](#).

6 - Clutch Pedal Crash Bolster

- Allocation. Refer to the [Electronic Parts Catalog \(ETKA\)](#).

7 - Bolt

- 30 Nm
- Always replace if removed



N48-10365

3.3 Steering Column, Removing and Installing, LHD, Vehicles without Knee Airbag

Special tools and workshop equipment required



- ◆ Torque Wrench, 6-50Nm -VAG 1331A-

V.A.G 1331



W00-0427

- ◆ Torque Wrench, 40-200Nm -V.A.G 1332A-

V.A.G 1332



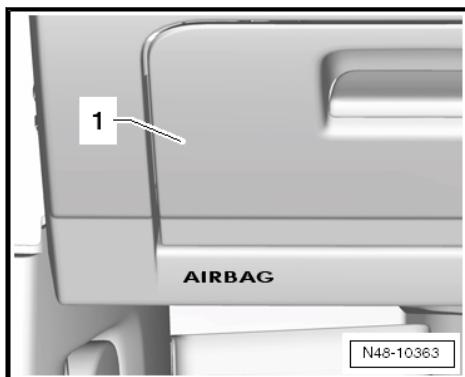
W00-0428

Removing



Note

- ◆ Check if a knee airbag is installed before beginning the work.
- ◆ If the word "AIRBAG" is located under the storage compartment -1- at the left near the steering wheel, a knee airbag is installed.



N48-10363

If a knee airbag is installed, the following repair procedure must be used. Refer to ⇒ C3.5 column, Removing and Installing, LHD, Vehicles with Knee Airbag, page 389 .

The steering column is delivered only as a complete replacement part. Servicing is not possible.

The steering lock housing can be replaced. Refer to ⇒ Electrical Equipment; Rep. Gr. 94; Ignition Switch and Lock Cylinder.



WARNING

Before starting work on electrical equipment and removing the steering wheel, the following conditions must be fulfilled:

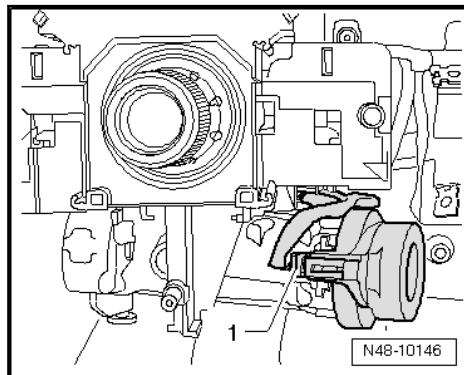
- ◆ *Disconnect the battery ground cable. Refer to ⇒ Electrical Equipment; Rep. Gr. 27; Battery; Battery, Disconnecting and Connecting.*
- ◆ *The wheels must be in the straight position.*

If these notes are not observed, the airbag system may not function properly during vehicle operation!

- Bring wheels in the straight position.
- Pull the lever on the side of the steering column downward.
- Swing steering column downward as far as possible and pull out.
- Push the lever on the side of the steering column upward again.
- Remove the steering wheel airbag. Refer to ⇒ Body Interior; Rep. Gr. 69; Airbag, Driver Side Airbag Unit, Removing and Installing.
- Remove the steering wheel. Refer to [⇒ W3.1 heel, Removing and Installing", page 375](#)
- Remove the steering column switch trim. Refer to ⇒ Body Interior; Rep. Gr. 68; Storage Compartments, Covers and Panels; Removing and Installing Steering Column Trim.
- Remove the steering column switch. Refer to ⇒ Electrical Equipment; Rep. Gr. 94; Steering Column Switch (Vehicles from 96/2010); Steering Column Switch Component Removal and Installation Sequence (from 06/2010).

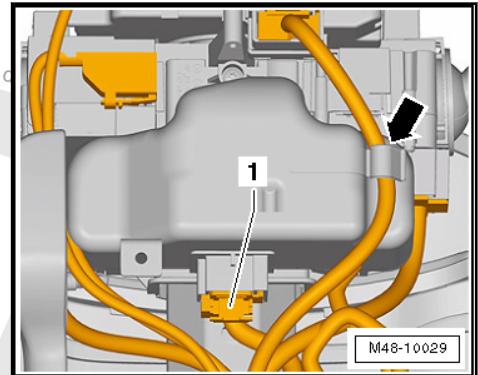
Vehicles with ignition switch

- Disconnect the connector -1-.





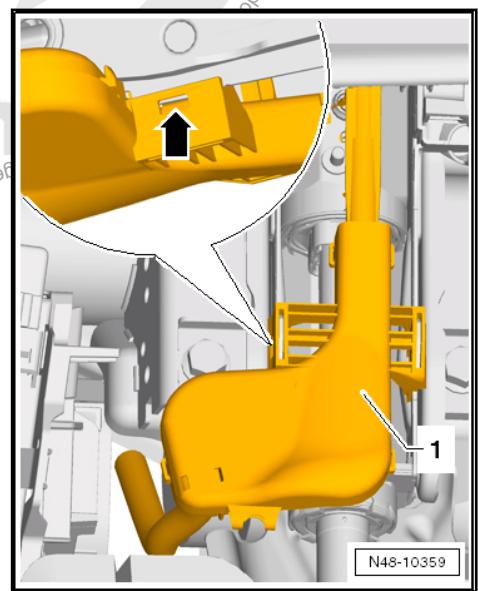
Vehicles with "Keyless Access" keyless locking and starting system



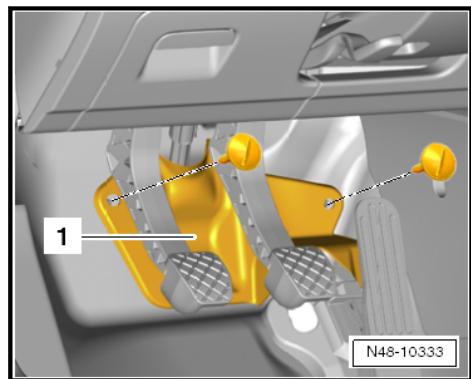
- Disconnect the connector -1-.
- Unclip the wire from the retainer on the Electronic Steering Column Lock Control Module -J764- -arrow-.

Continuation for all vehicles

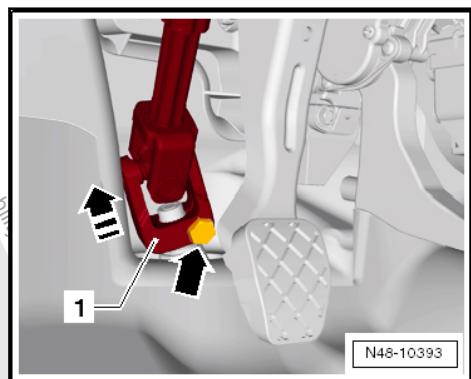
- Remove footwell vent outlets beneath steering column. Refer to ⇒ Heating, Ventilation and Air Conditioning; Rep. Gr. 80; Heater, Servicing.
- Press the tabs -arrow- on the cable channel -1- inward on both side. Then remove the cable channel -1- from the guide on the steering column.



- Remove the ground cable from the steering column.
- Remove the footwell trim panel -1-.



- Remove the bolt -arrow- from the universal joint -1-, and then remove the universal joint in the -direction of the arrow-.



Caution

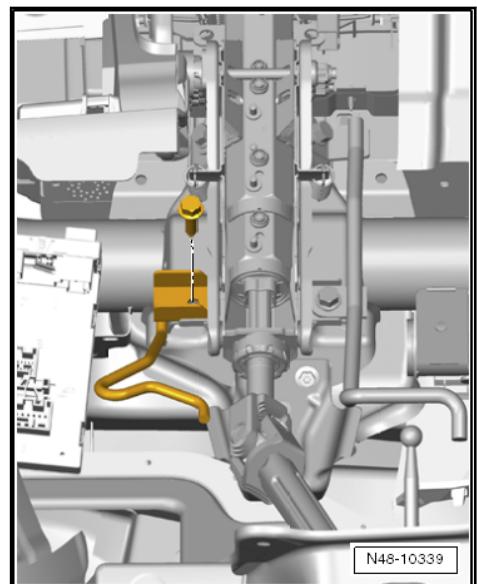
If the universal joint is separated from the steering gear, the following work cannot be performed:

- Switching on the ignition
- Turning the steering gear
- Turning the steering column.

These points must be observed since performing these actions could cause irreparable damage.

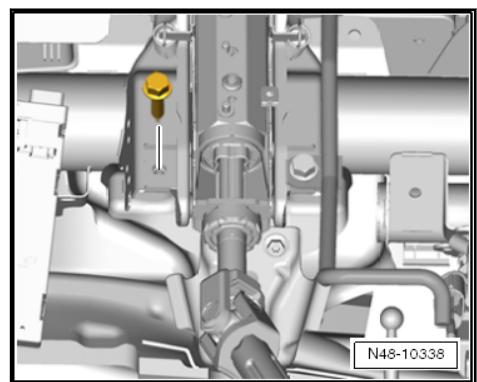


Vehicles with Manual Transmission



- Remove the left bolt and remove the clutch pedal crash brace.

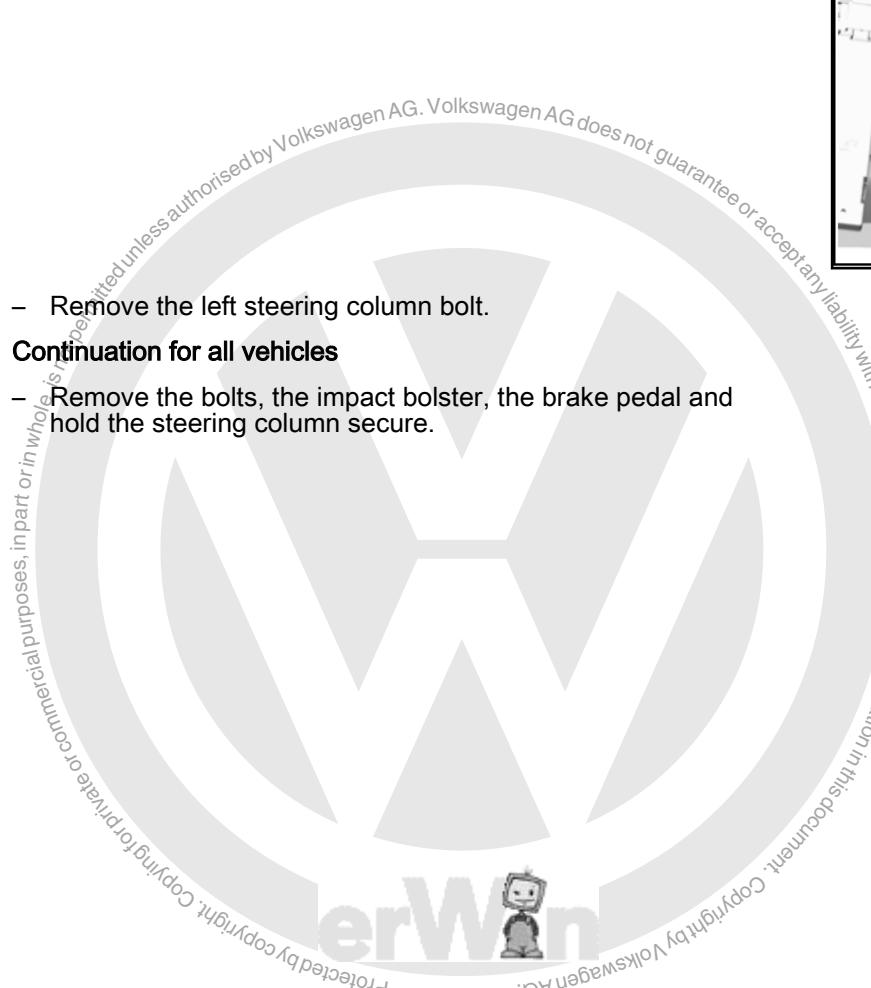
Vehicles with a DSG transmission and automatic transmission

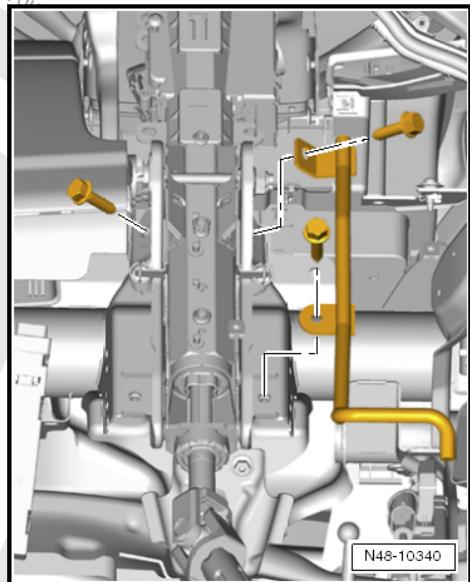


- Remove the left steering column bolt.

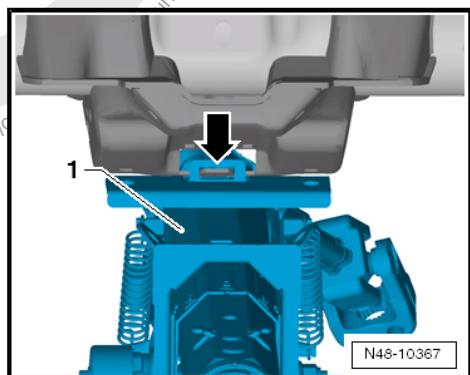
Continuation for all vehicles

- Remove the bolts, the impact bolster, the brake pedal and hold the steering column secure.





- Lower the steering column -1- and carefully remove it from the guide on the mounting bracket -arrow-.

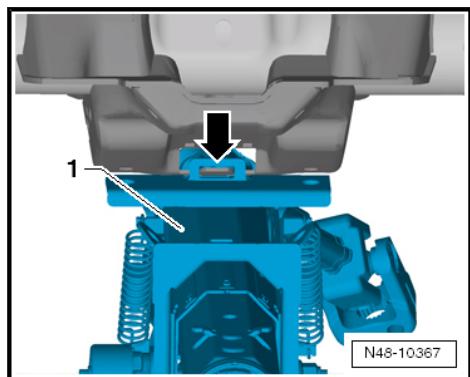


Caution

*Pay special attention to the correct handling and transport of the steering column. Refer to **C3.8 column, Handling and Transporting**, page 410.*

Installing

- Install the steering column -1- with the opening into the guide on the mounting bracket -arrow-.





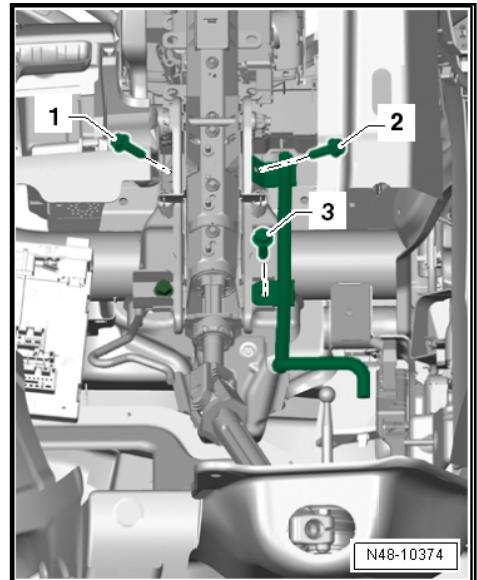
Only in this way is the correct installation position of steering column to mounting bracket guaranteed.



Note

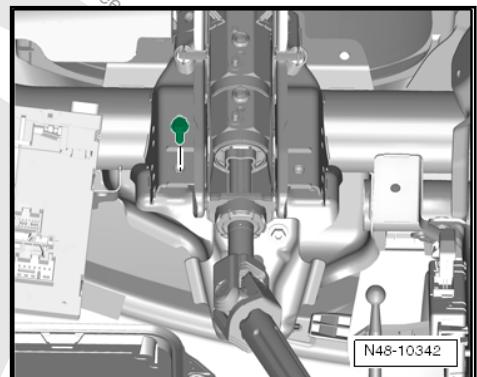
Always follow the bolt installation sequence when installing the steering column.

- Secure the steering column with the bolt -1-.



- Install the impact bolster, the brake pedal and the bolts -2- and -3-.

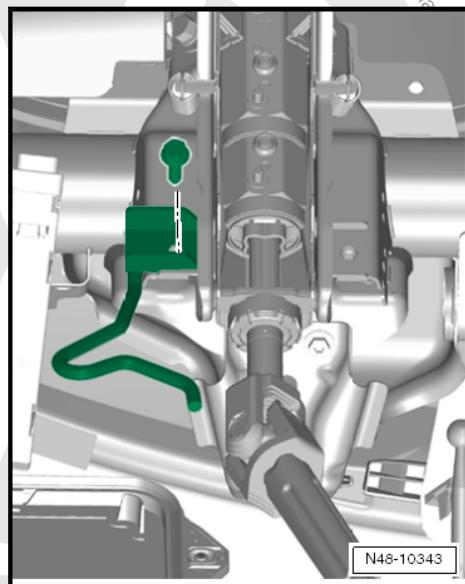
Vehicles with a DSG transmission and automatic transmission



- Secure the steering column with the bolt.



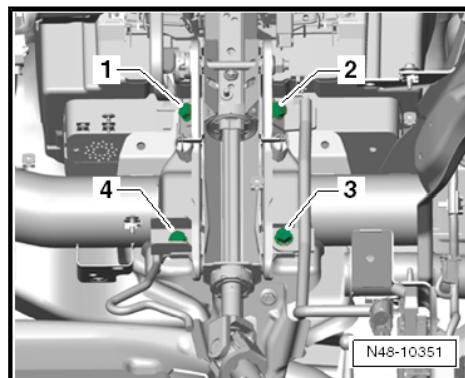
Vehicles with Manual Transmission



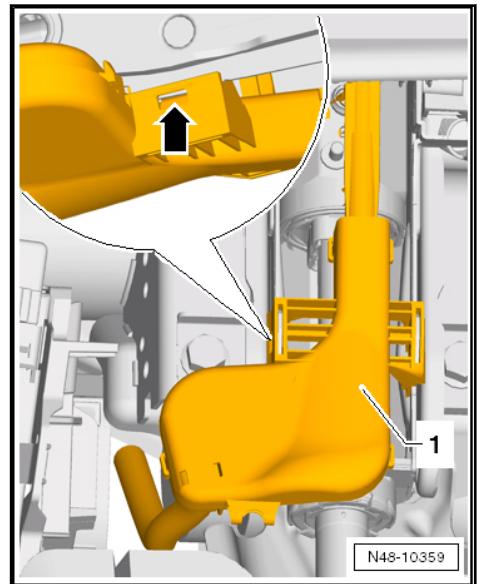
- Install the impact bolster and the clutch pedal, and then secure the steering column with the bolt.

Continuation for all vehicles

- Tighten the bolts to the tightening specification in the order shown.

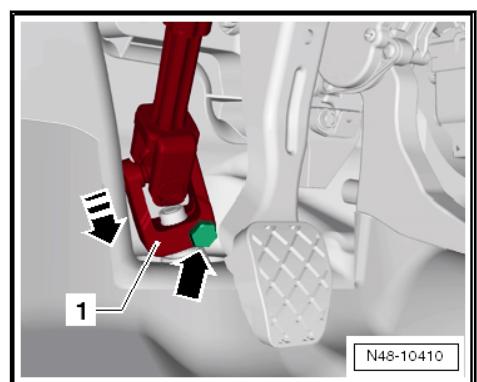


- Install cable channel -1- beneath steering column.

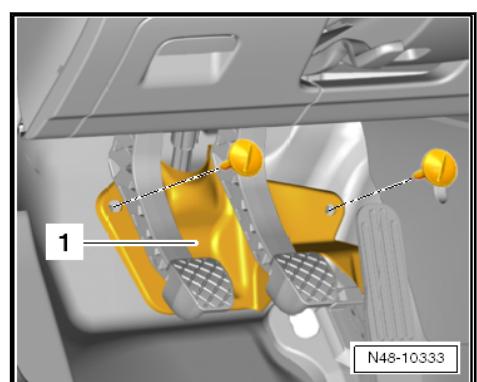


Tabs -arrow- must engage into guide on both sides.

- Attach the ground cable to the steering column.
- Install the universal joint -1- on the steering pinion in -direction of arrow-.



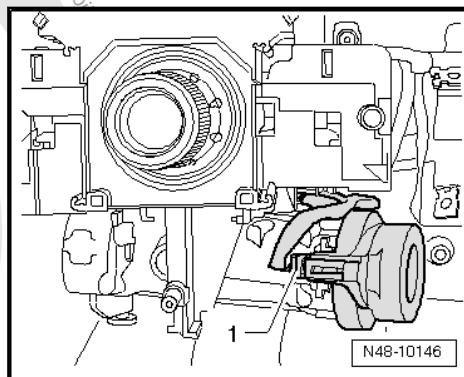
- Install and tighten the new bolt -arrow-.
- Install the footwell trim panel -1-.



- Install footwell vent outlets beneath steering column. Refer to ⇒ Heating, Ventilation and Air Conditioning; Rep. Gr. 80; Heater, Servicing.

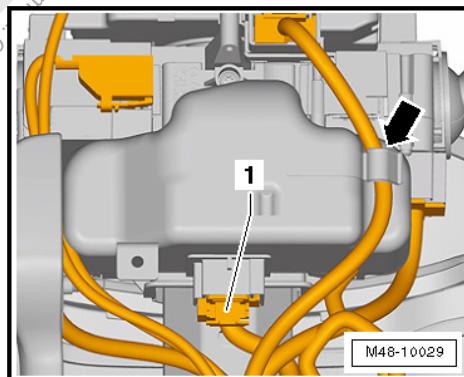


Vehicles with ignition switch



- Connect the connector -1-.

Vehicles with "Keyless Access" keyless locking and starting system



- Connect the connector -1-.
- Clip the wire into the retainer on the Electronic Steering Column Lock Control Module -J764- -arrow-.

Continuation for all vehicles

- Install the steering column switch. Refer to ⇒ Electrical Equipment; Rep. Gr. 94; Steering Column Switch (Vehicles from 96/2010); Steering Column Switch Component Removal and Installation Sequence (from 06/2010).
- Install the steering column switch trim. Refer to ⇒ Body Interior; Rep. Gr. 68; Storage Compartments, Covers And Panels; Removing and Installing, Steering Column Trim.
- Install the steering wheel. Refer to [⇒ W3.1 heel, Removing and Installing](#), page 375 .
- Install the airbag in the steering wheel. Refer to ⇒ Body Interior; Rep. Gr. 69; Airbag; Airbag Unit, Removing and Installing Driver Side.
- Perform a basic setting on the Steering Angle Sensor -G85- using the ⇒ Vehicle diagnostic tester.

Tightening Specifications

Component	Tightening Specification
Universal joint to steering gear ◆ Use a new bolt	30 Nm
Steering column to mounting bracket	20 Nm



3.4 Overview - Steering Column, LHD, Vehicles with Knee Airbag



Note

- ◆ Welding and alignment work on suspension components that are supporting or control the wheels is not permitted.
- ◆ Always replace self-locking nuts.
- ◆ Always replace corroded bolts/nuts.

1 - Assembly carrier with mounting bracket

2 - Steering Column

- Removing and Installing. Refer to [C3.5 column, Removing and Installing, LHD, Vehicles with Knee Airbag](#), page 389 .

3 - Bolt

- 20 Nm
- Observe the tightening sequence. Refer to [page 395](#) .

4 - Bolt

- 9 Nm

5 - Knee airbag bracket

- The crash bolsters for the clutch and brake pedal are welded to the knee airbag bracket.

6 - Bolt

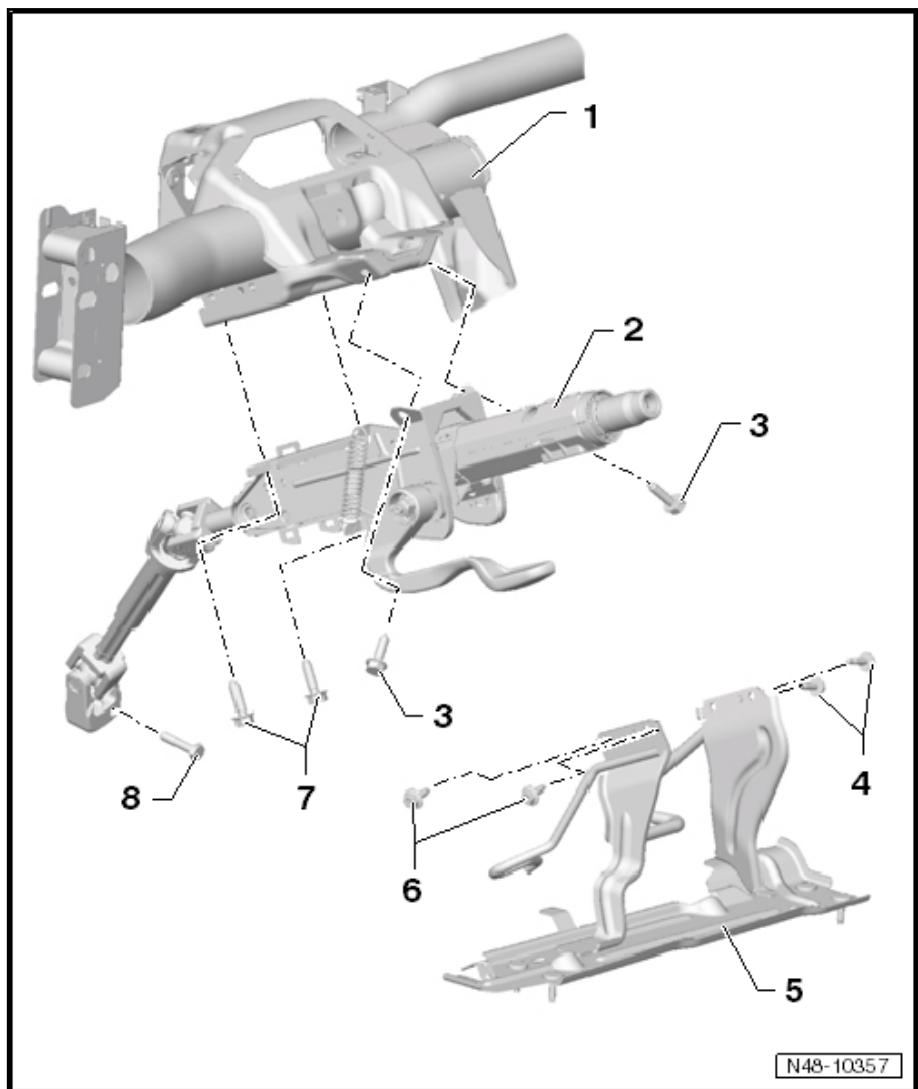
- 9 Nm

7 - Bolt

- 20 Nm
- Observe the tightening sequence. Refer to [page 395](#) .

8 - Bolt

- 30 Nm
- Always replace if removed



3.5 Steering Column, Removing and Installing, LHD, Vehicles with Knee Airbag

Special tools and workshop equipment required



- ◆ Torque Wrench, 6-50Nm -VAG 1331A-

V.A.G 1331



W00-0427

- ◆ Torque Wrench, 40-200Nm -V.A.G 1332A-

V.A.G 1332

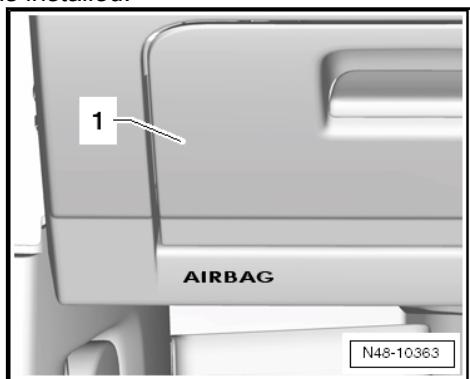


W00-0428

Removing



- ◆ Check if a knee airbag is installed before beginning the work.
- ◆ The word "AIRBAG" is located under the storage compartment -1- at the left near the steering wheel. If this word is there, a knee airbag is installed.



N48-10363

If no knee airbag is installed, the following repair procedure must be used. Refer to ⇒ C3.3 column, Removing and Installing, LHD, Vehicles without Knee Airbag, page 378 .

The steering column is delivered only as a complete replacement part. Servicing is not possible.

The steering lock housing can be replaced. Refer to ⇒ Electrical Equipment; Rep. Gr. 94; Ignition Switch and Lock Cylinder.



WARNING

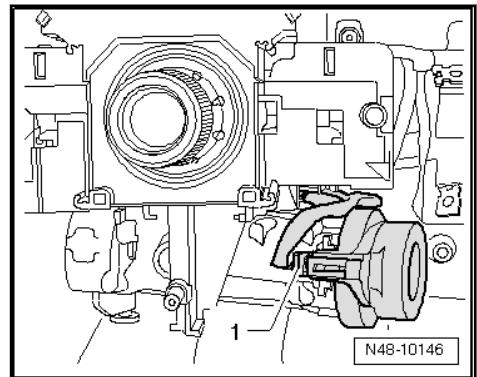
Before starting work on electrical equipment and removing the steering wheel, the following conditions must be fulfilled:

- ◆ *Disconnect the battery ground cable. Refer to ⇒ Electrical Equipment; Rep. Gr. 27; Battery; Battery, Disconnecting and Connecting.*
- ◆ *The wheels must be in the straight position.*

If these notes are not observed, the airbag system may not function properly during vehicle operation!

- Bring wheels in the straight position.
- Pull the lever on the side of the steering column downward.
- Swing steering column downward as far as possible and pull out.
- Push the lever on the side of the steering column upward again.
- Remove the steering wheel airbag. Refer to ⇒ Body Interior; Rep. Gr. 69; Airbag; Driver Side Airbag Unit, Removing and Installing.
- Remove the steering wheel. Refer to ⇒ W3.1 heel, Removing and Installing, page 375 .
- Remove the steering column switch trim. Refer to ⇒ Body Interior; Rep. Gr. 68; Storage Compartments, Covers and Panels; Removing and Installing Steering Column Trim.
- Remove the steering column switch. Refer to ⇒ Electrical Equipment; Rep. Gr. 94; Steering Column Switch (Vehicles from 96/2010); Steering Column Switch Component Removal and Installation Sequence (from 06/2010).

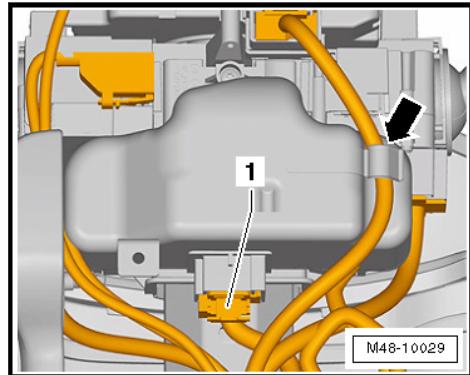
Vehicles with ignition switch



- Disconnect the connector -1-.



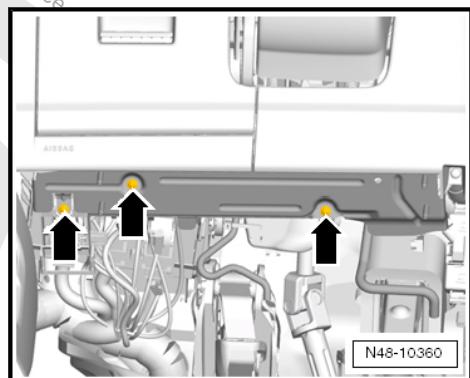
Vehicles with "Keyless Access" keyless locking and starting system



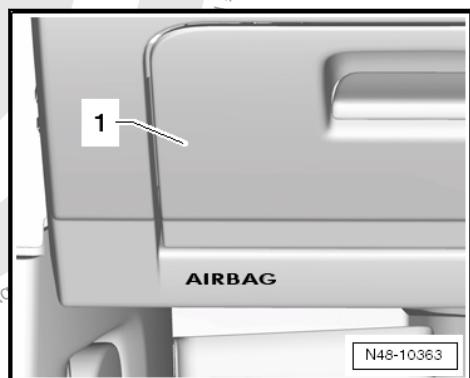
- Disconnect the connector -1-.
- Unclip the wire from the retainer on the Electronic Steering Column Lock Control Module -J764- -arrow-.

Continuation for all vehicles

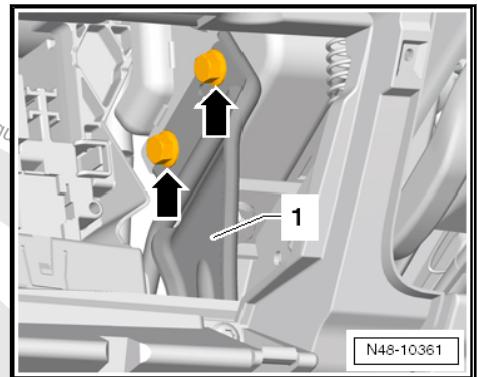
- Remove footwell vent outlets beneath steering column. Refer to ⇒ Heating, Ventilation and Air Conditioning; Rep. Gr. 80; Heater, Servicing.
- Remove the knee airbag. Refer to ⇒ Body Interior; Rep. Gr. 69; Airbag; Knee Airbag, Removing and Installing.
- Remove the bolts -arrows-



- Remove the storage compartment -1-.

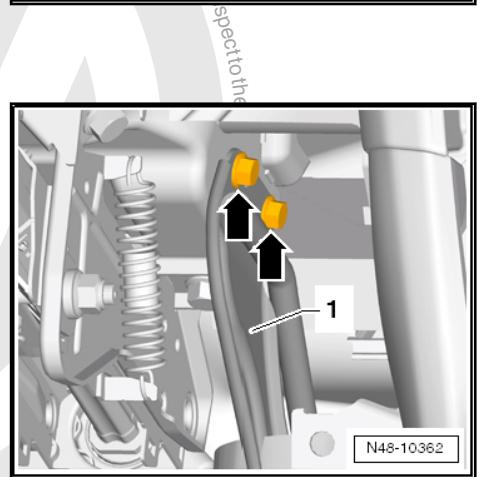


- Remove the bolts -arrows- from the knee airbag bracket -1- on the left side.



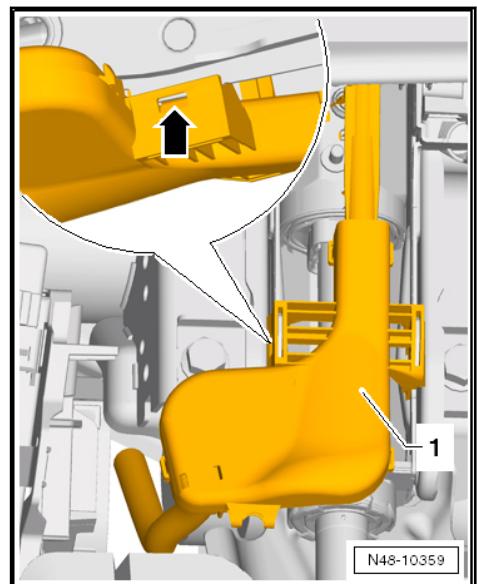
N48-10361

- Remove the bolts -arrows- from the knee airbag bracket -1- on the right side.



N48-10362

- Remove the knee airbag bracket.
- Press the tabs -arrow- on the cable channel -1- inward on both side. Then remove the cable channel -1- from the guide on the steering column.



N48-10359

- Remove the ground cable from the steering column.
- Remove the footwell trim panel -1-.

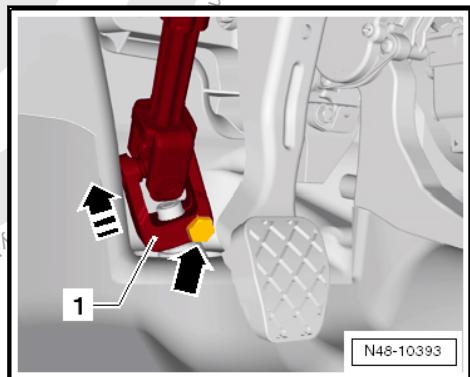
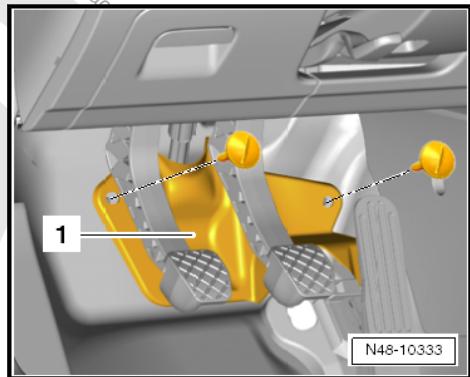


Golf Variant 2010 ➤

Suspension, Wheels, Steering - Edition 09.2022

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Volkswagen AG.

- Remove the bolt -arrow- from the universal joint -1-, and then remove the universal joint in the -direction of the arrow-.



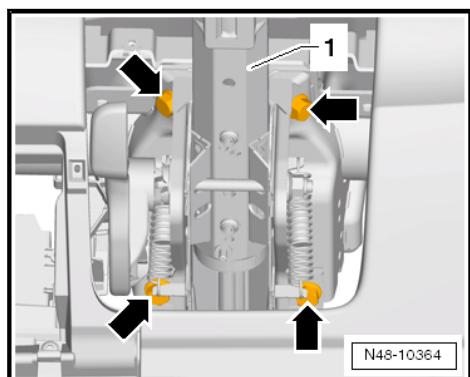
Caution

If the universal joint is separated from the steering gear, the following work cannot be performed:

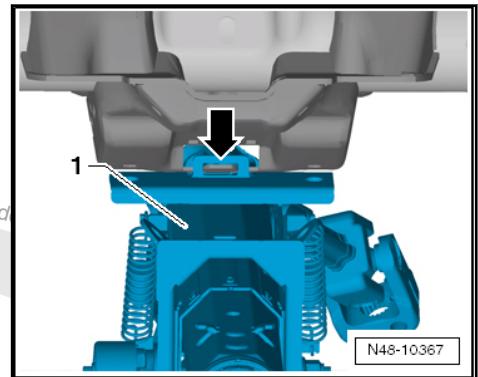
- ◆ *Switching on the ignition*
- ◆ *Turning the steering gear*
- ◆ *Turning the steering column.*

These points must be observed since performing these actions could cause irreparable damage.

- Hold the steering column steady -1- and remove the screws -arrows-.



- Lower the steering column -1- and carefully remove it from the guide on the mounting bracket -arrow-.

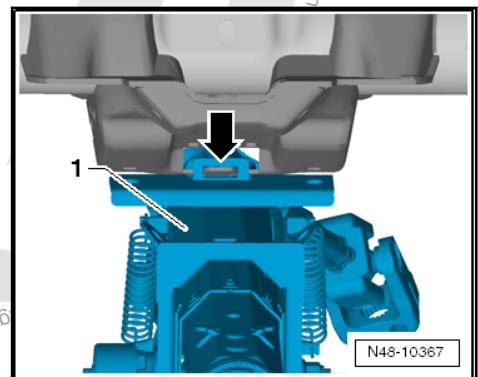


Caution

Pay special attention to the correct handling and transport of the steering column. Refer to [C3.8 column, Handling and Transporting](#), page 410.

Installing

- Install the steering column -1- with the opening into the guide on the mounting bracket -arrow-.



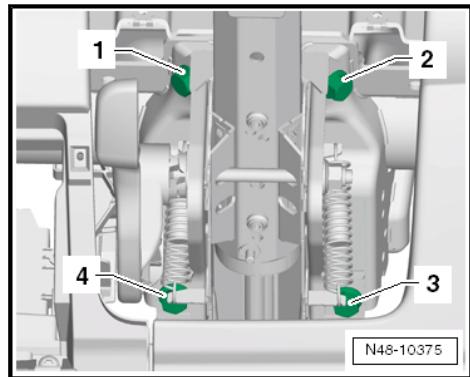
Only in this way is the correct installation position of steering column to mounting bracket guaranteed.



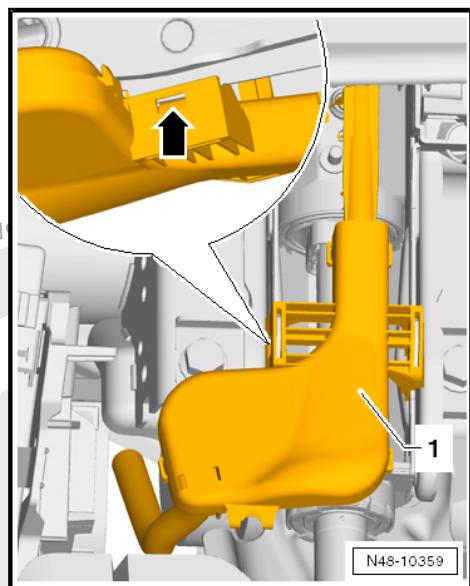
Note

Always follow the bolt installation sequence when installing the steering column.

- Secure the steering column with the bolts -1-, -2-, -3- and -4- one after the other.

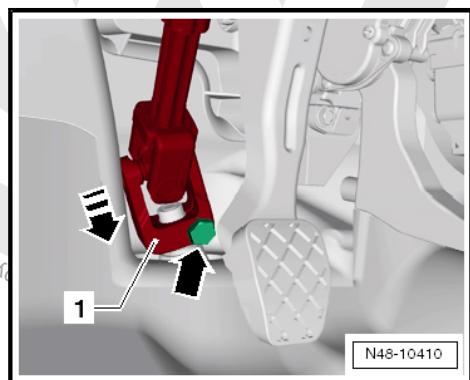


- Tighten the bolts to the tightening specification in the order shown.
- Install cable channel -1- beneath steering column.

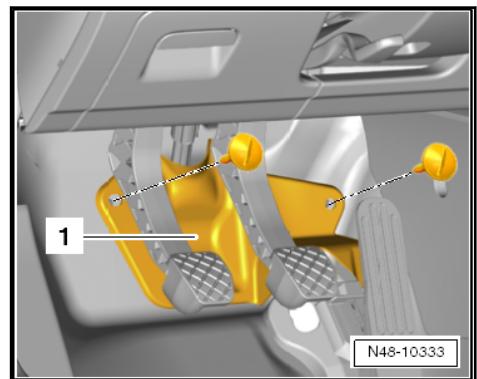


Tabs -arrow- must engage into guide on both sides.

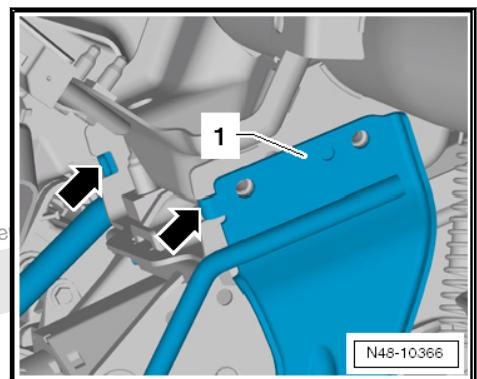
- Attach the ground cable to the steering column.
- Install the universal joint -1- on the steering pinion in -direction of arrow-.



- Install and tighten the new bolt -arrow-.
- Install the footwell trim panel -1-.

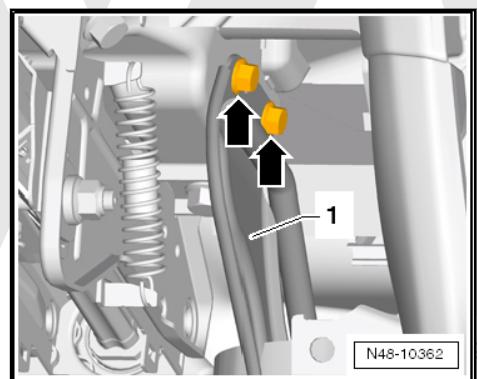


- Insert the knee airbag bracket -1- in the mounting bracket assembly carrier.

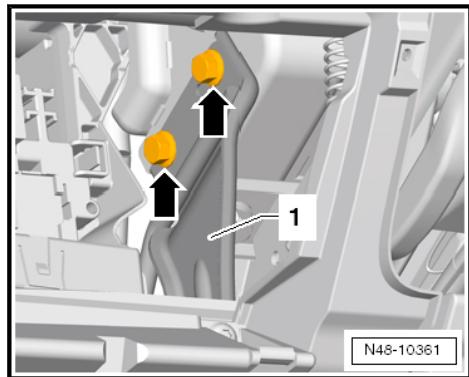


The tabs on the knee airbag bracket -1- must engage in the openings -arrows- on the mounting bracket assembly carrier.

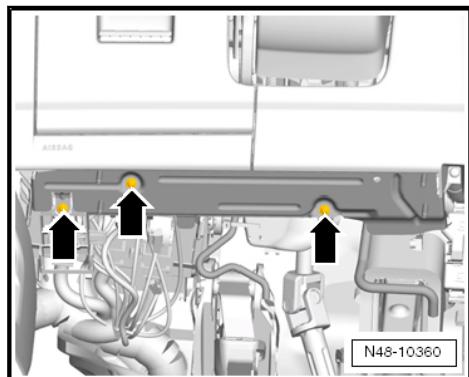
- Install the bolts -arrows- on the knee airbag bracket -1- on the right side.



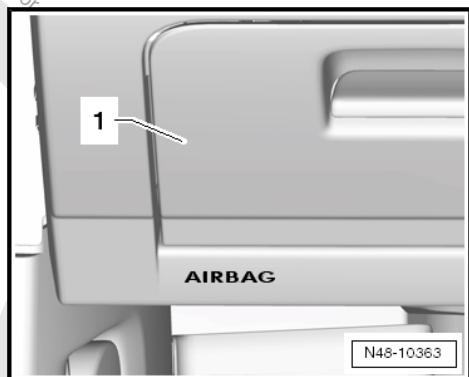
- Install the bolts -arrows- on the knee airbag bracket -1- on the left side.



- Tighten the bolts -arrows-.



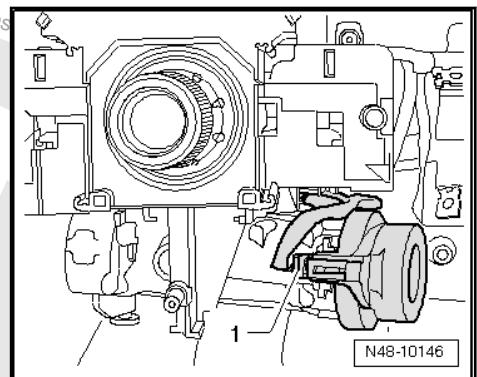
- Install the storage compartment -1-.



- Install the knee airbag. Refer to ⇒ Body Interior; Rep. Gr. 69; Airbag, Knee Airbag, Removing and Installing.
- Install footwell vent outlets beneath steering column. Refer to ⇒ Heating, Ventilation and Air Conditioning; Rep. Gr. 80; Heater, Servicing.

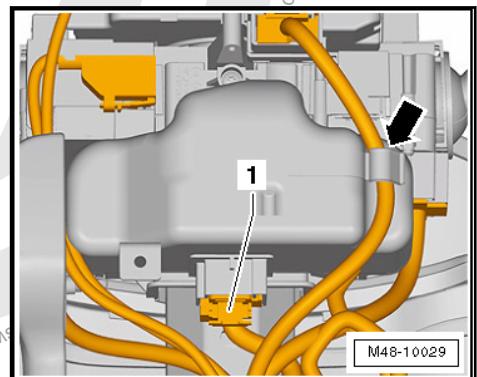


Vehicles with ignition switch



- Connect the connector -1-.

Vehicles with "Keyless Access" keyless locking and starting system



- Connect the connector -1-.
- Clip the wire into the retainer on the Electronic Steering Column Lock Control Module -J764- -arrow-.

Continuation for all vehicles

- Install the steering column switch. Refer to ⇒ Electrical Equipment; Rep. Gr. 94; Steering Column Switch (Vehicles from 96/2010); Steering Column Switch Component Removal and Installation Sequence (from 06/2010).
- Install the steering column switch trim. Refer to ⇒ Body Interior; Rep. Gr. 68; Storage Compartments, Covers And Panels; Removing and Installing, Steering Column Trim.
- Install the steering wheel. Refer to [⇒ W3.1 heel, Removing and Installing](#), page 375 .
- Install the airbag in the steering wheel. Refer to ⇒ Body Interior; Rep. Gr. 69; Airbag; Airbag Unit, Removing and Installing Driver Side.
- Perform a basic setting on the Steering Angle Sensor -G85- using the ⇒ Vehicle diagnostic tester.

Tightening Specifications

Component	Tightening Specification
Universal joint to steering gear ◆ Use a new bolt	30 Nm
Steering column to mounting bracket	20 Nm



3.6 Overview - Steering Column, RHD - Not for USA/CDN Market



Note

- ◆ Welding and alignment work on suspension components that are supporting or control the wheels is not permitted.
- ◆ Always replace self-locking nuts.
- ◆ Always replace corroded bolts/nuts.



1 - Bolt

- 20 Nm

2 - Assembly Carrier
3 - Brace
4 - Bolt

- 20 Nm

5 - Mounting Bracket
6 - Brake Pedal Crash Brace

- Allocation. Refer to the
⇒ Electronic Parts Catalog (ETKA).

7 - Bolt

- 20 Nm

8 - Bolt

- 9 Nm

9 - Bolt

- 9 Nm

10 - Knee airbag bracket
11 - Bolt

- 9 Nm

- The bolting is done on the right brace for the assembly carrier.

12 - Bolt

- 30 Nm

- Always replace if removed

13 - Bolt

- 20 Nm

- Observe the tightening sequence. Refer to [⇒ page 407](#).

14 - Bolt

- 20 Nm

- Observe the tightening sequence. Refer to [⇒ page 407](#).

15 - Steering Column

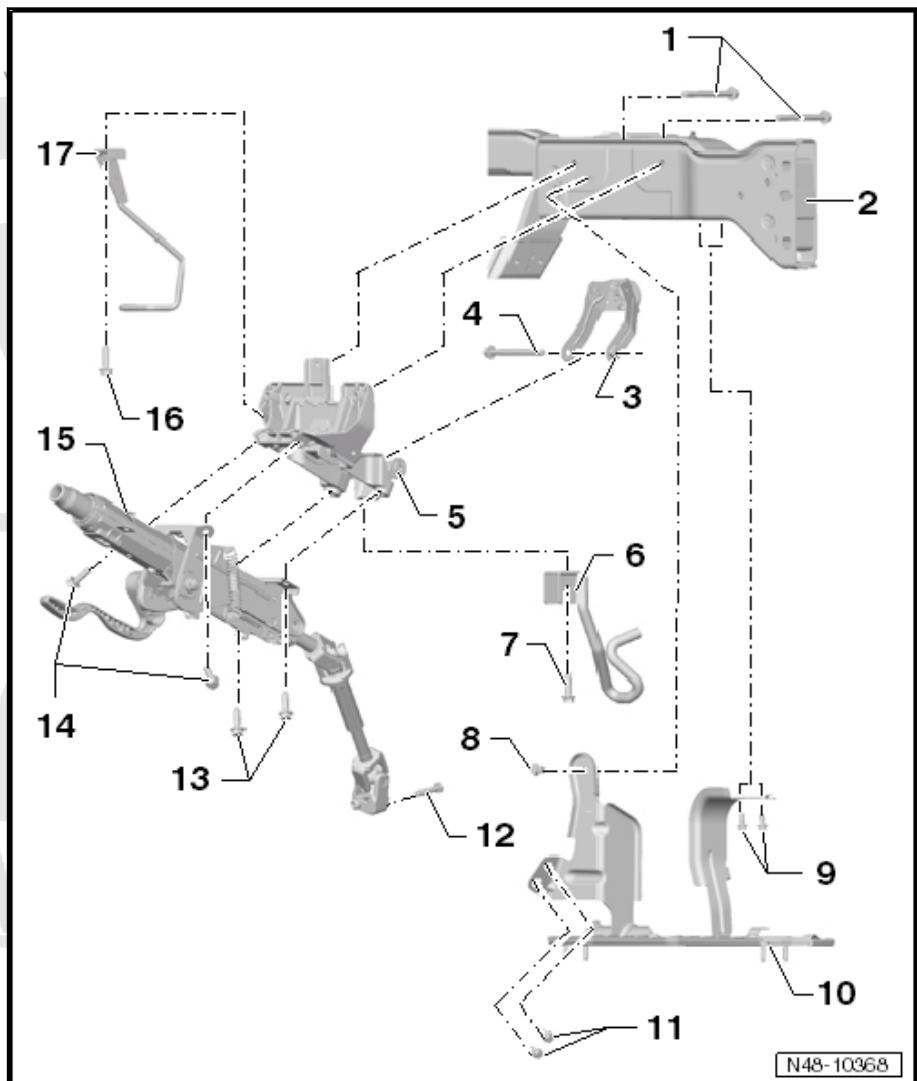
- Removing and Installing. Refer to [⇒ C3.7 olumn, Removing and Installing, RHD - Not for USA/CDN Market](#), page 401.

16 - Bolt

- 20 Nm

17 - Clutch Pedal Crash Bolster

- Allocation. Refer to the ⇒ Electronic Parts Catalog (ETKA).



N48-10368

3.7 Steering Column, Removing and Installing, RHD - Not for USA/CDN Market

Special tools and workshop equipment required



- ◆ Torque Wrench, 6-50Nm -VAG 1331A-

V.A.G 1331



W00-0427

- ◆ Torque Wrench, 40-200Nm -V.A.G 1332A-

V.A.G 1332



W00-0428

Removing

The steering column is delivered only as a complete replacement part. Servicing is not possible.

The steering lock housing can be replaced. Refer to ⇒ Electrical Equipment; Rep. Gr. 94; Ignition Switch and Lock Cylinder.



WARNING

Before starting work on electrical equipment and removing the steering wheel, the following conditions must be fulfilled:

- ◆ *Disconnect the battery ground cable. Refer to ⇒ Electrical Equipment; Rep. Gr. 27; Battery; Battery, Disconnecting and Connecting.*
- ◆ *The wheels must be in the straight position.*

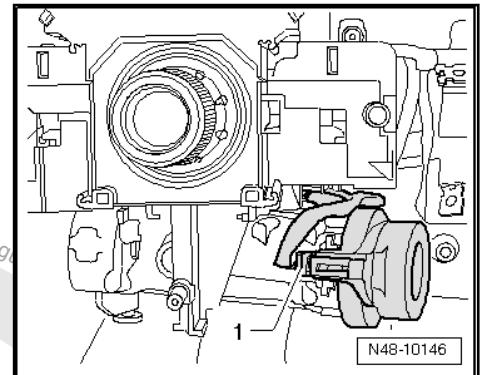
If these notes are not observed, the airbag system may not function properly during vehicle operation!

- Bring wheels in the straight position.
- Pull the lever on the side of the steering column downward.
- Swing steering column downward as far as possible and pull out.
- Push the lever on the side of the steering column upward again.
- Remove the steering wheel airbag. Refer to ⇒ Body Interior; Rep. Gr. 69; Airbag; Driver Side Airbag Unit, Removing and Installing.
- Remove the steering wheel. Refer to [⇒ W3.1 heel, Removing and Installing”, page 375](#).



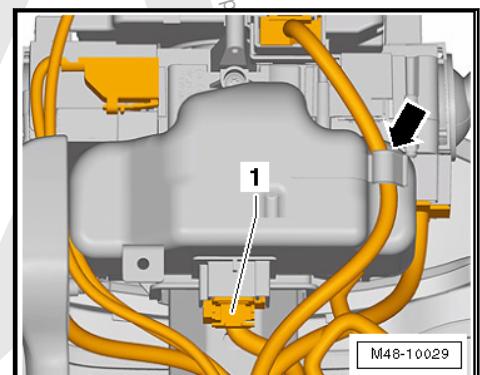
- Remove the steering column switch trim. Refer to ⇒ Body Interior; Rep. Gr. 68; Storage Compartments, Covers and Panels; Removing and Installing Steering Column Trim.
- Remove the steering column switch. Refer to ⇒ Electrical Equipment; Rep. Gr. 94; Steering Column Switch (Vehicles from 96/2010); Steering Column Switch Component Removal and Installation Sequence (from 06/2010).

Vehicles with ignition switch



- Disconnect the connector -1-.

Vehicles with "Keyless Access" keyless locking and starting system



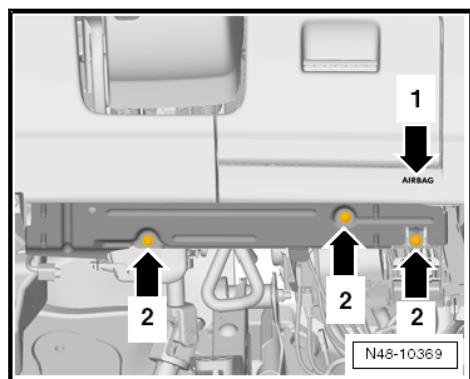
- Disconnect the connector -1-.
- Unclip the wire from the retainer on the Electronic Steering Column Lock Control Module -J764- arrow -.

Continuation for all vehicles

- Remove footwell vent outlets beneath steering column. Refer to ⇒ Heating, Ventilation and Air Conditioning; Rep. Gr. 80; Heater, Servicing.

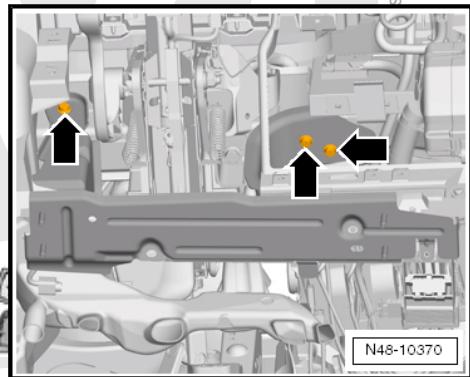


Vehicles with knee airbag

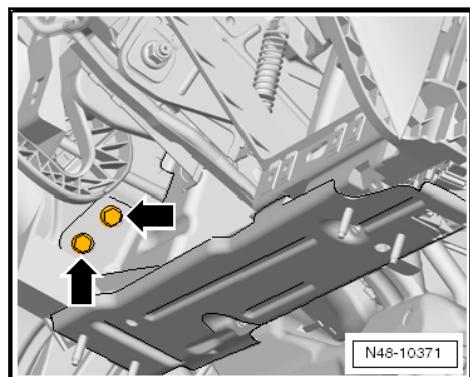


The word "AIRBAG" -arrow 1- is located under the right storage compartment near the steering wheel. If this word is there, a knee airbag is installed.

- Remove the knee airbag. Refer to ⇒ Body Interior; Rep. Gr. 69; Airbag; Knee Airbag, Removing and Installing.
- Remove the bolts -arrows 2-.
- Remove the left and right driver side trim. Refer to ⇒ Body Interior; Rep. Gr. 70; Instrument Panel.
- Remove the bolts -arrows- for the knee airbag bracket from the assembly carrier.



- Remove the bolts -arrows- for the knee airbag bracket on the left side.

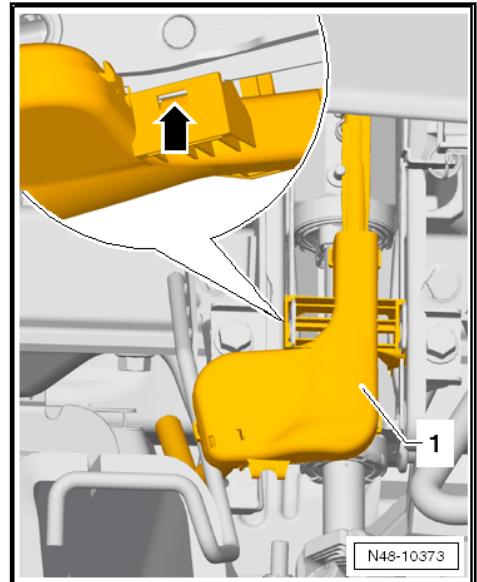


- Remove the knee airbag bracket.

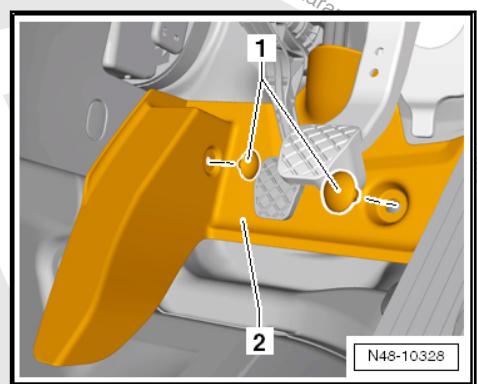


Continuation for all vehicles

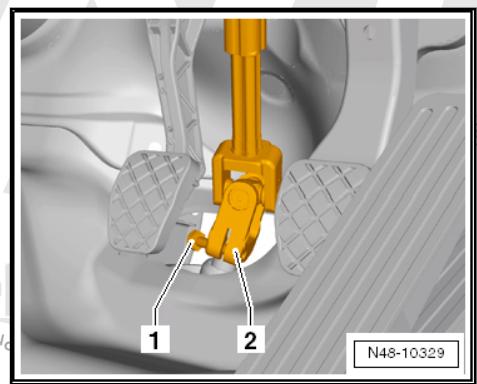
- Press the tabs -arrow- on the cable channel -1- inward on both side. Then remove the cable channel -1- from the guide on the steering column.



- Remove the ground cable from the steering column.
- Remove the footwell trim -2-, unscrew the nuts -1- to do so.



- Remove the bolt -1- and remove the universal joint -2- from the steering gear.





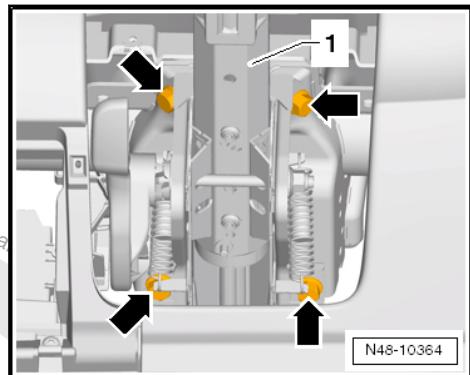
Caution

If the universal joint is separated from the steering gear, the following work cannot be performed:

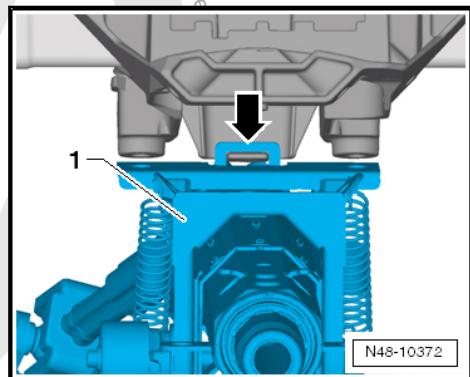
- ◆ *Switching on the ignition*
- ◆ *Turning the steering gear*
- ◆ *Turning the steering column.*

These points must be observed since performing these actions could cause irreparable damage.

- Hold the steering column steady -1- and remove the screws -arrows-.



- Lower the steering column -1- and carefully remove it from the guide on the mounting bracket -arrow-.

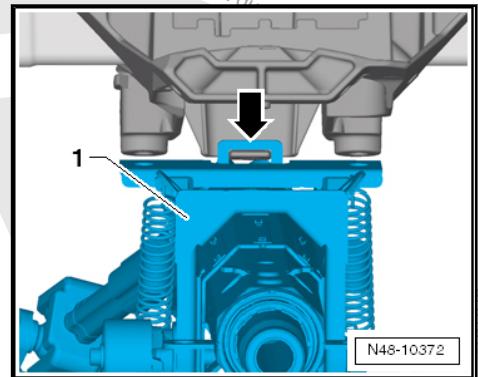


Caution

Pay special attention to the correct handling and transport of the steering column. Refer to ➔ C3.8 column, Handling and Transporting", page 410 .

Installing

- Install the steering column -1- with the opening into the guide on the mounting bracket -arrow-.



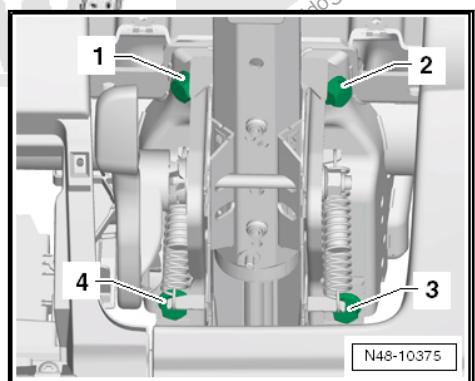
Only in this way is the correct installation position of steering column to mounting bracket guaranteed.



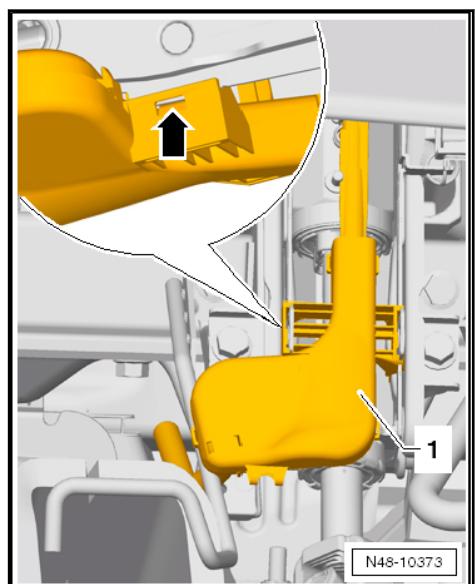
Note

Always follow the bolt installation sequence when installing the steering column.

- Secure the steering column with the bolts -1-, -2-, -3- and -4- one after the other.



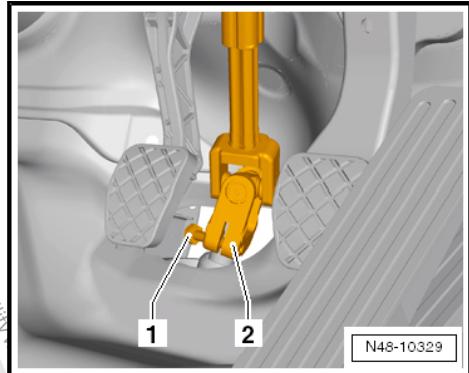
- Tighten the bolts to the tightening specification in the order shown.
- Install cable channel -1- beneath steering column.



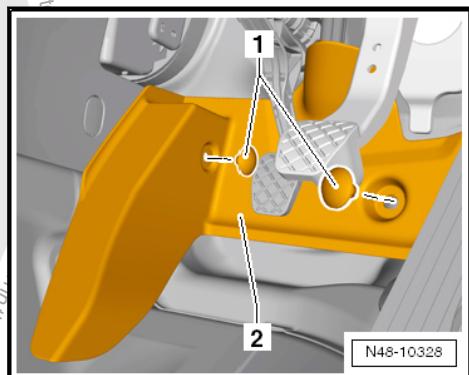


Tabs -arrow- must engage into guide on both sides.

- Attach the ground cable to the steering column.
- Connect universal joint -2- onto steering gear pinion and tighten the bolt -1-.

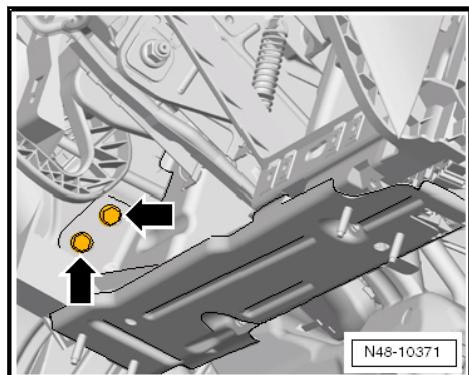


- Install the footwell trim panel -2- and tighten the nuts -1-.

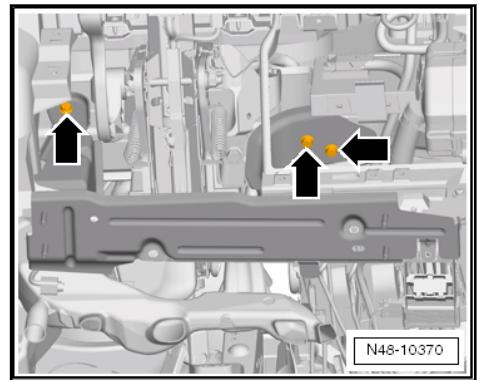


Vehicles with knee airbag

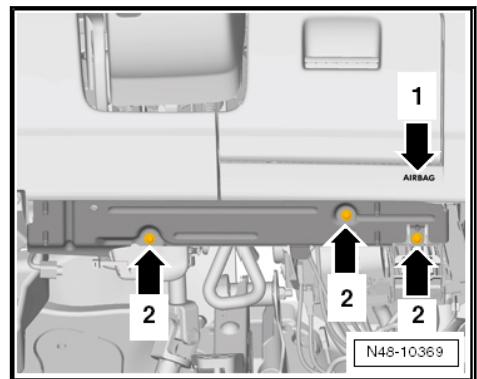
- Insert the knee airbag bracket.
- Install the bolts -arrows- for the knee airbag bracket on the left side.



- Install the bolts -arrows- for the knee airbag bracket on the assembly carrier.



- Install the left and right driver side trim. Refer to ⇒ Body Interior; Rep. Gr. 70; Instrument Panel.
- Install the right storage compartment.
- Tighten the bolts -arrows 2-.

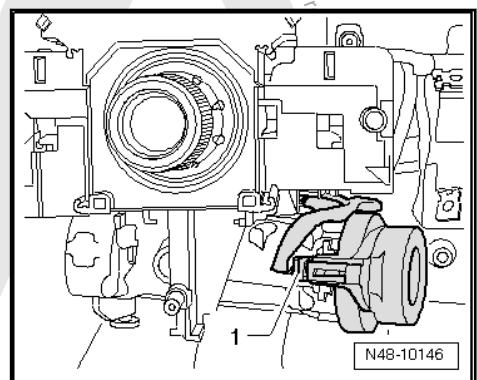


- Install the knee airbag. Refer to ⇒ Body Interior; Rep. Gr. 69; Airbag; Knee Airbag, Removing and Installing.

Continuation for all vehicles

- Install footwell vent outlets beneath steering column. Refer to ⇒ Heating, Ventilation and Air Conditioning; Rep. Gr. 80; Heater, Servicing.

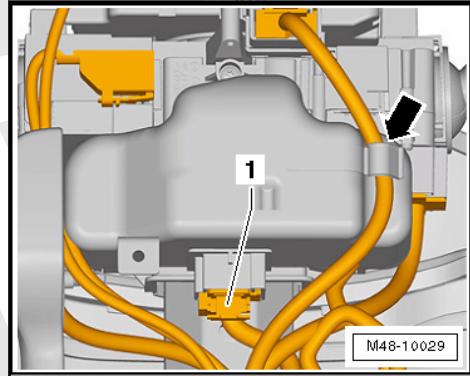
Vehicles with ignition switch



- Connect the connector -1-



Vehicles with "Keyless Access" keyless locking and starting system



- Connect the connector -1-.
- Clip the wire into the retainer on the Electronic Steering Column Lock Control Module -J764- [arrow].

Continuation for all vehicles

- Install the steering column switch. Refer to ⇒ Electrical Equipment; Rep. Gr. 94; Steering Column Switch (Vehicles from 96/2010); Steering Column Switch Component Removal and Installation Sequence (from 06/2010).
- Install the steering column switch trim. Refer to ⇒ Body Interior; Rep. Gr. 68; Storage Compartments, Covers And Panels; Removing and Installing, Steering Column Trim.
- Install the steering wheel. Refer to ⇒ [W3.1 heel, Removing and Installing](#), page 375.
- Install the airbag in the steering wheel. Refer to ⇒ Body Interior; Rep. Gr. 69; Airbag; Airbag Unit, Removing and Installing Driver Side.
- Perform a basic setting on the Steering Angle Sensor -G85- using the ⇒ Vehicle diagnostic tester.

Tightening Specifications

Component	Tightening Specification
Universal joint to steering gear ◆ Use a new bolt	30 Nm
Steering column to mounting bracket	20 Nm

3.8 Steering Column, Handling and Transporting

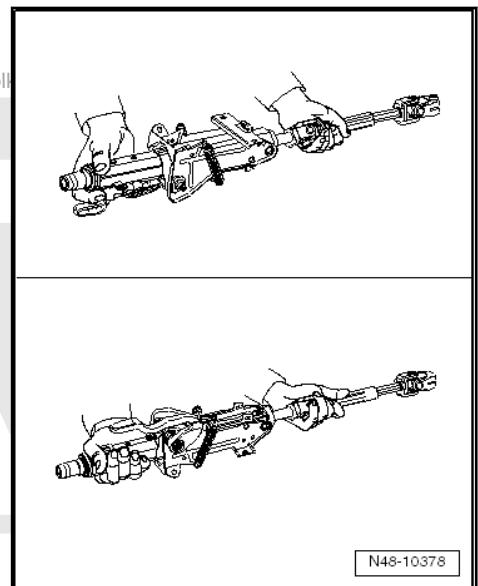


WARNING

- ◆ *The steering column must always be handled correctly.*
- ◆ *Incorrect handling of steering column may cause damage to steering column and therefore lead to a safety risk.*

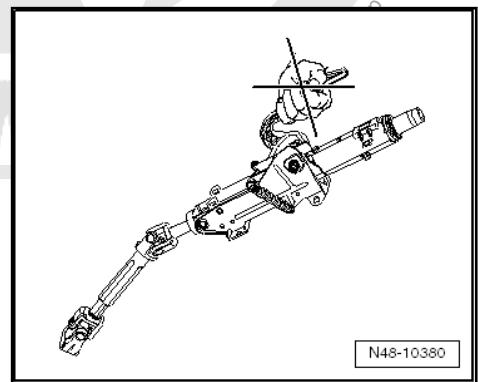


Correct handling and transport of steering column



- ◆ Transport steering column using two hands.
- ◆ Grasp steering column at upper steering column tube and in area of upper universal joint.

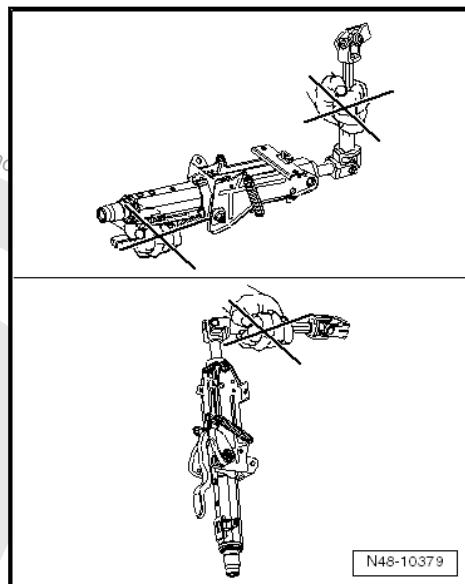
Incorrect handling of steering column



Transporting at the clamping lever leads to damage to the steering column.



Incorrect handling of steering column with safety risk



The following handling techniques can lead to damage of the universal joint bushings, the lower steering column bearing or the steering column:

- ◆ Transporting steering column with one hand on joint shaft.
- ◆ Bending joints more than 90°.

3.9 Steering Column, Checking for Damage

Visual check

- Check whether parts of steering column indicate damage.

Function Test

- Check whether steering column can be turned without catching or difficulty of movement.
- Check if the steering column can be adjusted with respect to length and height.



4 Electro-Mechanical Steering Gear

⇒ **-4.1 Electro-Mechanical Steering Gear, LHD", page 413**

⇒ **G4.3 ear, Removing and Installing, LHD", page 416**

4.1 Overview - Electro-Mechanical Steering Gear, LHD



Caution

If the universal joint is separated from the steering gear, the following work cannot be performed:

- ◆ *Switching on the ignition*
- ◆ *Turning the steering gear*
- ◆ *Turning the steering column.*

These points must be observed since performing these actions could cause irreparable damage.





1 - Wire

2 - Universal Joint

3 - Bolt

- 30 Nm
- Always replace if removed

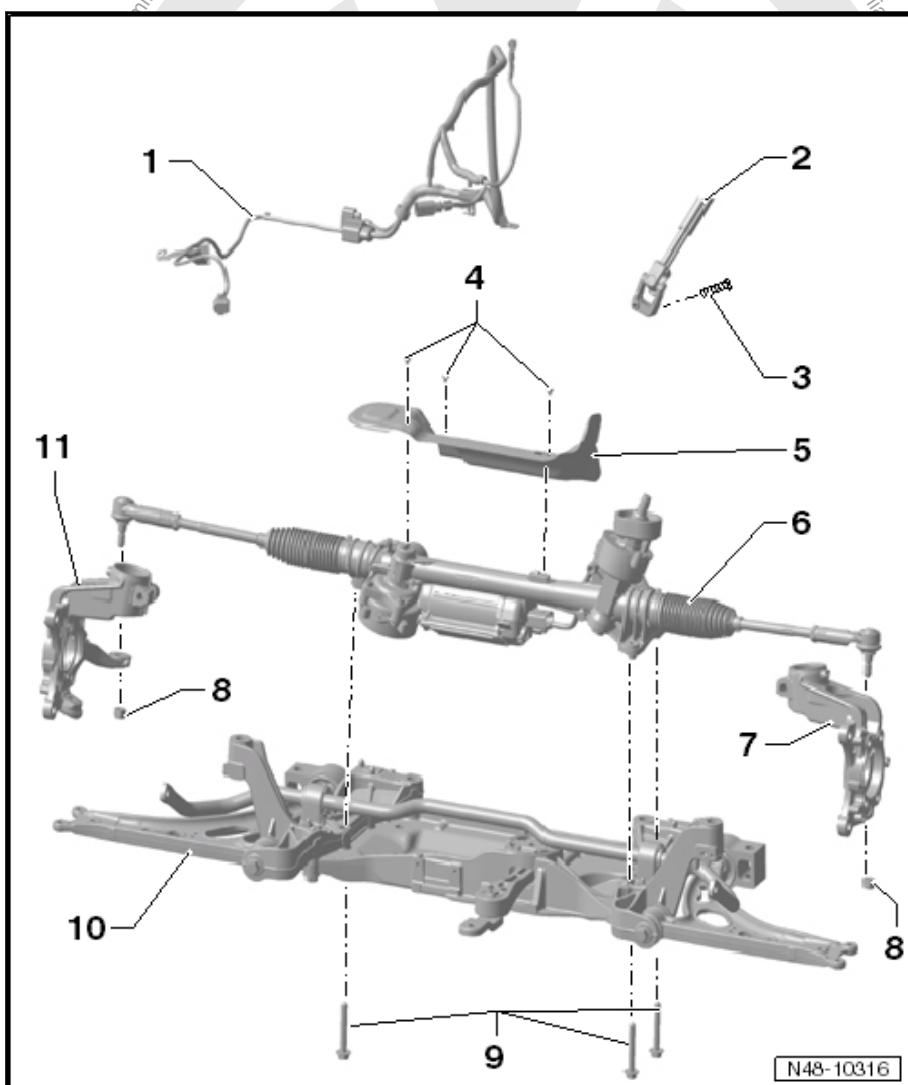
4 - TORX Screw

- 6 Nm
- Self-tapping

5 - Shield

6 - Power Steering Gear

- With Power Steering Control Module -J500-
- With Electromechanical Power Steering Motor -V187-
- With Steering Angle Sensor -G85-
- With Steering Torque Sensor -G269-
- Can be tested in Guided Fault Finding using the Vehicle Diagnostic Tester.
- Removing and Installing. Refer to [G4.3 ear, Removing and Installing, LHD](#), page 416 .



Note

Correct any faults stored in the DTC memory before replacing the steering gear using the ⇒ Vehicle diagnostic tester.

7 - Left Wheel Bearing Housing

8 - Nut

- 20 Nm + 90° additional turn
- Self-locking
- Always replace if removed

9 - Bolt

- 50 Nm + 90° additional turn
- Always replace if removed

10 - Subframe

11 - Right Wheel Bearing Housing



4.2 Overview - Electro-Mechanical Steering Gear, RHD - Not for USA/CDN Market



Caution

If the universal joint is separated from the steering gear, the following work cannot be performed:

- ◆ *Switching on the ignition*
- ◆ *Turning the steering gear*
- ◆ *Turning the steering column.*

These points must be observed since performing these actions could cause irreparable damage.





1 - Universal Joint

2 - Bolt

- 30 Nm
- Always replace if removed

3 - Wire

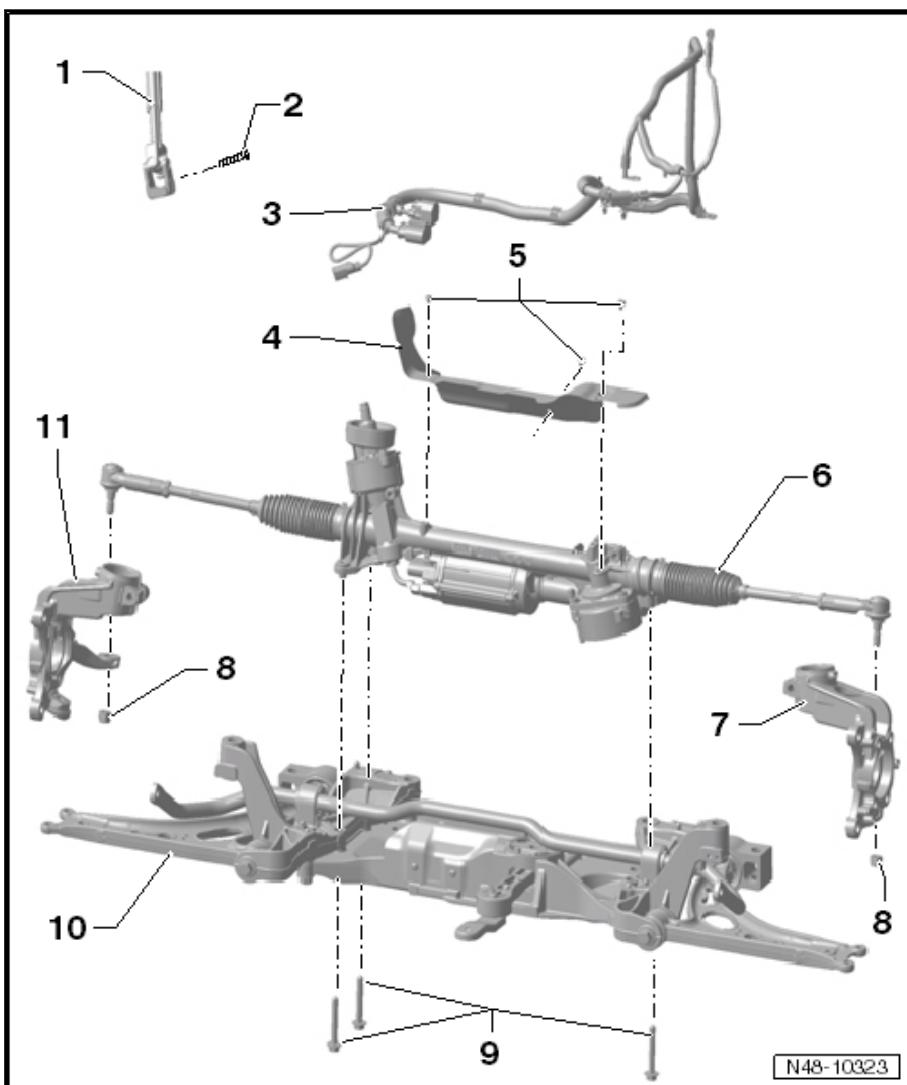
4 - Shield

5 - TORX Screw

- 6 Nm
- Self-tapping

6 - Power Steering Gear

- With Power Steering Control Module -J500-
- With Electromechanical Power Steering Motor - V187-
- With Steering Angle Sensor -G85-
- With Steering Torque Sensor -G269-
- Can be tested in Guided Fault Finding using the Vehicle Diagnostic Tester.
- Removing and Installing. Refer to [G4.4 ear, Removing and Installing, RHD - Not for USA/CDN Market](#), page 426 .



Note

Correct any faults stored in the DTC memory before replacing the steering gear using the ⇒ Vehicle diagnostic tester.

7 - Left Wheel Bearing Housing

8 - Nut

- 20 Nm + 90° additional turn
- Self-locking
- Always replace if removed

9 - Bolt

- 50 Nm + 90° additional turn
- Always replace if removed

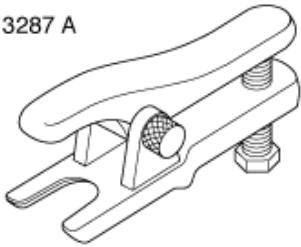
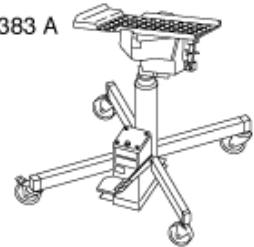
10 - Subframe

11 - Right Wheel Bearing Housing

4.3 Steering Gear, Removing and Installing, LHD



Special tools and workshop equipment required

 3287 A	 V.A.G 1331
 V.A.G 1332	 V.A.G 1383 A

W48-10004

- ◆ Torque Wrench, 6-50Nm -VAG 1331A-
- ◆ Torque Wrench, 40-200Nm -V.A.G 1332A-
- ◆ Engine and Gearbox Jack -VAS 6931-
- ◆ Puller - Ball Joint -3287 A-

Steering gear, removing



Note

Correct any faults stored in the DTC memory before replacing the steering gear using the ⇒ Vehicle diagnostic tester.

- Connect the ⇒ Vehicle diagnostic tester and start “Guided Fault Finding”.

Follow the instructions on the screen.

- Turn the steering wheel in the straight position and remove the ignition key so that the steering wheel lock engages.

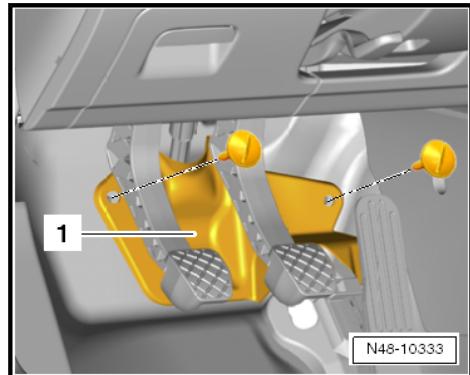


Vehicles with "Keyless Access" keyless locking and starting system

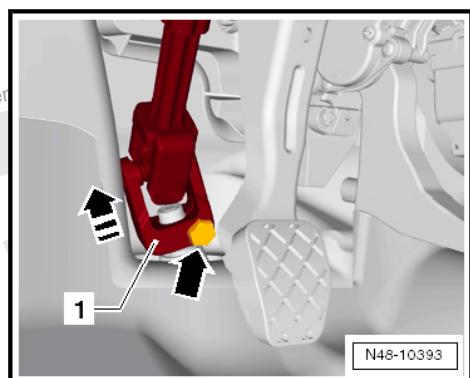
- Switch the ignition off and open the driver door so the steering wheel lock engages.

Continuation for all vehicles

- Disconnect the battery. Refer to ⇒ Rep. Gr. 27; Battery; Battery, Disconnecting and Connecting.
- Remove the footwell trim panel -1-.



- Remove the bolt -arrow- from the universal joint -1-, and then remove the universal joint in the -direction of the arrow-.



Caution

If the universal joint is separated from the steering gear, the following work cannot be performed:

- ◆ **Switching on the ignition**
- ◆ **Turning the steering gear**
- ◆ **Turning the steering column.**

These points must be observed since performing these actions could cause irreparable damage.

- Remove the front wheels.
- Loosen the nut of the tie rod end, but do not remove yet.

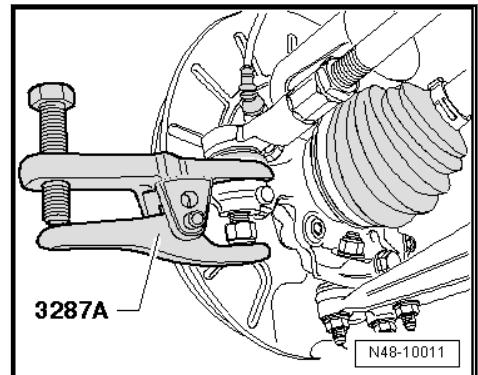


Caution

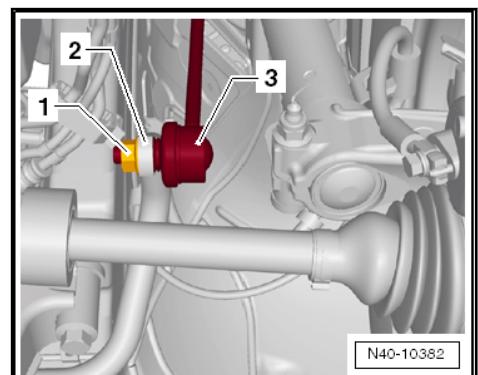
To protect the thread, screw the nut on the pin several turns.



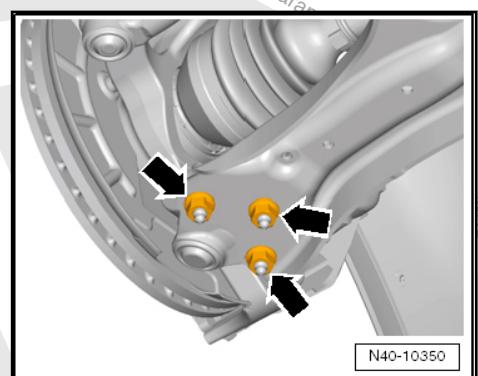
- Press tie rod end off of wheel bearing housing using -3287A-.



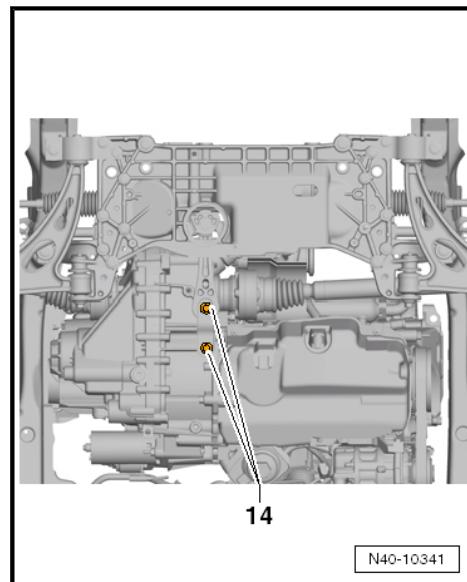
- Remove the lower noise insulation. Refer to ⇒ Rep. Gr. 50; Overview - Noise Insulation.
- Remove the right and left nuts -1- from the coupling rods -3-.



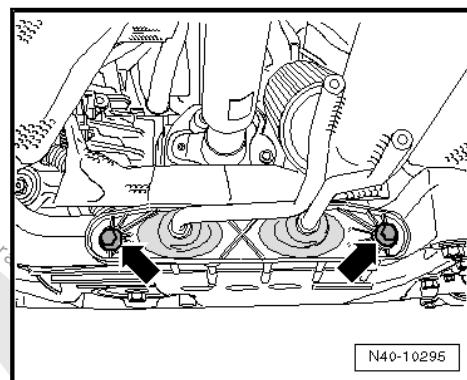
- Remove the coupling rods -3- from the stabilizer bar -2-.
- Remove the nuts -arrows-.



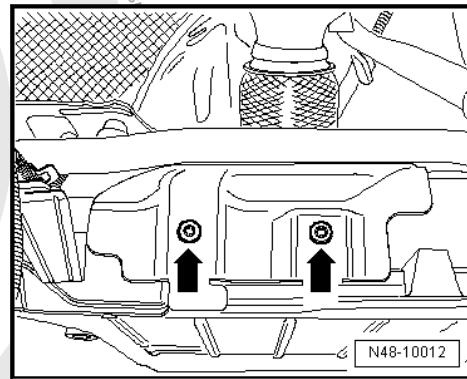
- Remove the bolts -14- and then remove the pendulum support from the transmission.



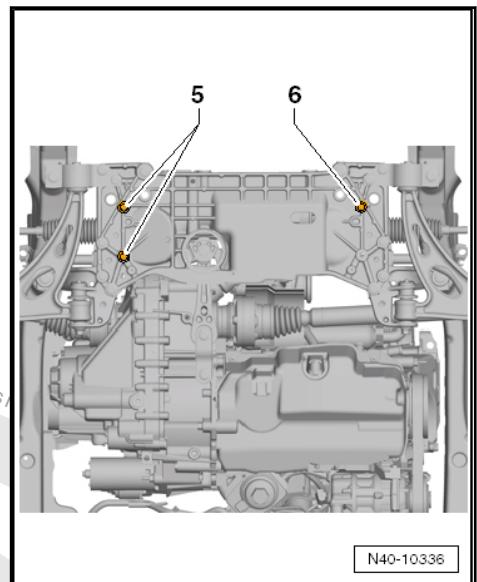
- Remove the exhaust system bracket from the subframe -arrows-.



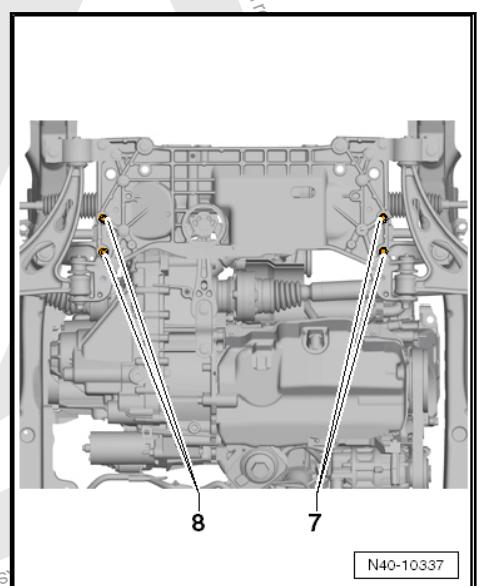
- If equipped, remove the heat shield bolts -arrows-.



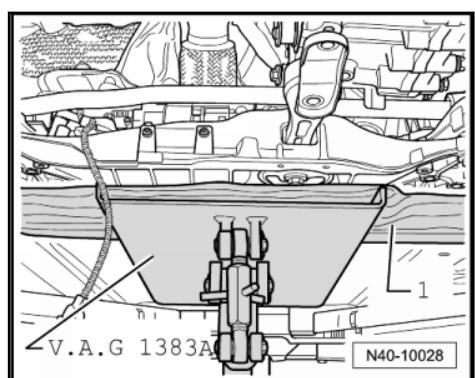
- If equipped, remove the subframe heat shield.
- Remove the bolts -5- and -6- on the steering gear.



- Remove the stabilizer bar bolts -7- and -8-.

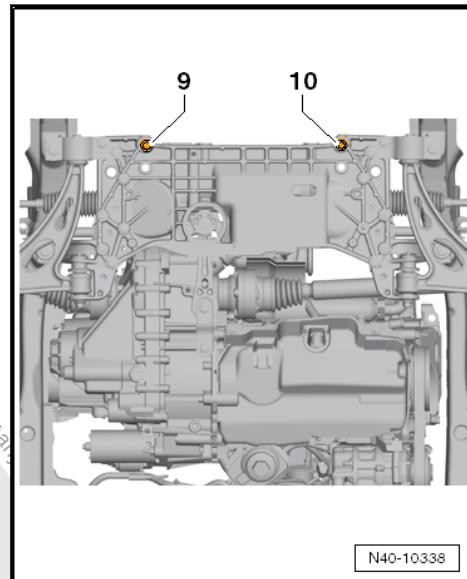


- Locate the subframe and brackets. Refer to [a3.5 nd Brackets, Securing](#), page 16
- Disconnect the connector for the service interval extension to the oil pan.
- Place the Engine and Gearbox Jack -VAS 6931- under the subframe.

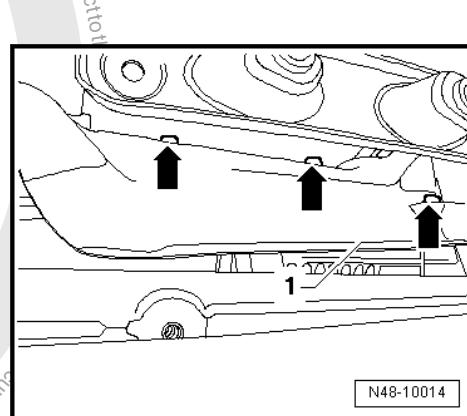




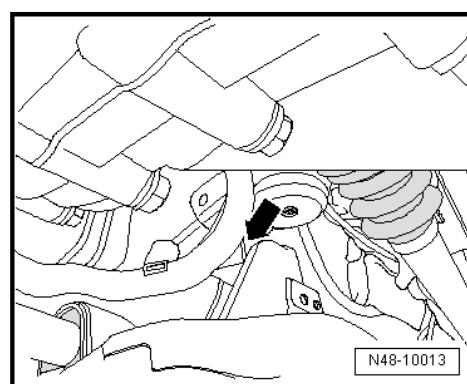
- Place a block of wood -1-, for example, between the Engine and Gearbox Jack -VAS 6931- and the subframe.
- Remove the bolts -9- and -10- and lower the subframe with the brackets slightly. Observe the wires when doing this.



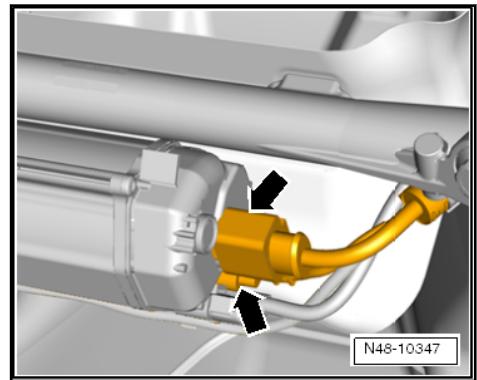
- Remove heat shield -1- above exhaust system.



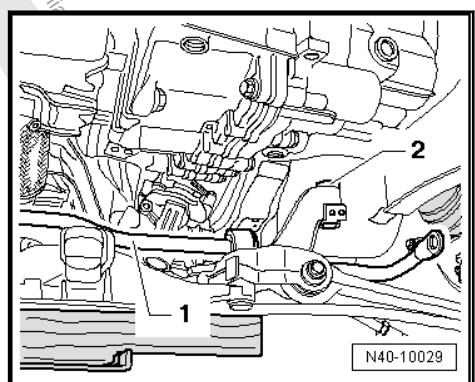
- Remove the bolts -arrows-.
- Remove the cable guide from the subframe -arrow-.



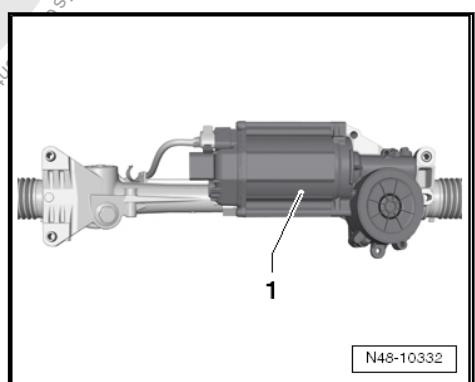
- Unclip all other cable mounting points on the steering gear.
- Remove the connectors -arrows- from the steering gear.



- Carefully lower the subframe using the Engine and Gearbox Jack -VAS 6931.
- Now, lift the stabilizer bar -1- toward the front, over the subframe -2- and down, while turning the stabilizer bar slightly.



- Lift down steering gear from subframe.
- Set down steering gear as depicted in the illustration.



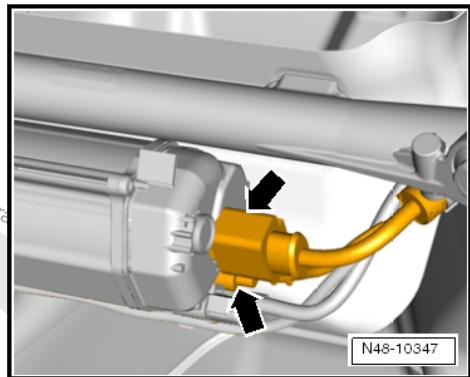
This prevents damage to the control module -1-.

Steering Gear, Installing

Install in reverse order of removal.

The steering gear threaded sleeves must be seated in the bracket holes.

- Connect the connectors -arrows- so that they click into place.



Note

- ◆ Coat the seal on the steering gear with lubricant such as soft soap before installing the steering gear.
- ◆ After attaching the steering gear to the drive axle, make sure that the seal on the steering gear rests on the mounting plate without kinks and seals the opening to the footwell correctly. Water leak and/or noises may be the result.
- ◆ Make sure sealing surfaces are clean.

Before fastening the bolts for subframe, position steering gear on subframe and fasten bolts for steering gear and stabilizer.

- Clamp off the electrical connections to the steering gear.
- Install the lower noise insulation. Refer to ⇒ Rep. Gr. 50; Overview - Noise Insulation.



Note

Make sure the ball joint boot is not damaged or twisted.

- Bolt the universal joint to the steering gear.
- Connect the battery. Refer to ⇒ Rep. Gr. 27; Battery; Battery, Disconnecting and Connecting.
- Perform basic setting on the -G85-Steering Angle Sensor with the ⇒ Vehicle diagnostic tester.

It is necessary to adapt the electromechanical steering with the ⇒ Vehicle diagnostic tester if new steering gear was installed.

- Adapt the electromechanical steering with the ⇒ Vehicle diagnostic tester.

Chassis

Electromechanical power steering

01 - OBD-capable system

Electro-mechanical power steering

Functions

Adapting electro-mechanical steering

Follow the instructions on the screen.

After installation, the position of steering wheel must be checked with a road test.



If the steering wheel is crooked or new steering gear was installed, check the toe on the front axle and adjust it if necessary.

- Align the vehicle. Refer to [⇒ A8 alignment](#), page 340 .

Tightening Specifications

Component	Tightening Specification
Subframe to body ◆ Different versions ◆ Allocation. Refer to the ⇒ Electronic Parts Catalog (ETKA). ◆ Use new bolts.	◆ M12 x 1.5 x 100: 70 Nm + 90° ◆ M12 x 1.5 x 110: 70 Nm
Bracket to body ◆ Use new bolts.	70 Nm + 90°
Mounting bracket to body ◆ Use new bolts.	70 Nm + 90°
Stabilizer bar to subframe ◆ Use new bolts.	20 Nm + 90°
Stabilizer bar to coupling rod ◆ Use a new nut ◆ Counterhold at joint pin inner multi-point fitting	65 Nm
Control arm to cast-steel control arm ◆ Use new nuts	60 Nm
Control arm to steel panel or aluminum control arm ◆ Use new nuts	100 Nm
Shield to subframe ◆ M6 bolt is self-tapping	6 Nm
Steering gear to subframe ◆ Use new bolts.	50 Nm + 90°
Universal joint to steering gear ◆ Use a new bolt	30 Nm
Shield to steering gear ◆ M6 bolt is self-tapping	6 Nm
Tie rod end to wheel bearing housing ◆ Use a new nut	20 Nm + 90°
Exhaust system bracket to subframe. Refer to ⇒ Engine Mechanical, Fuel Injection and Ignition; Rep. Gr. 26.	

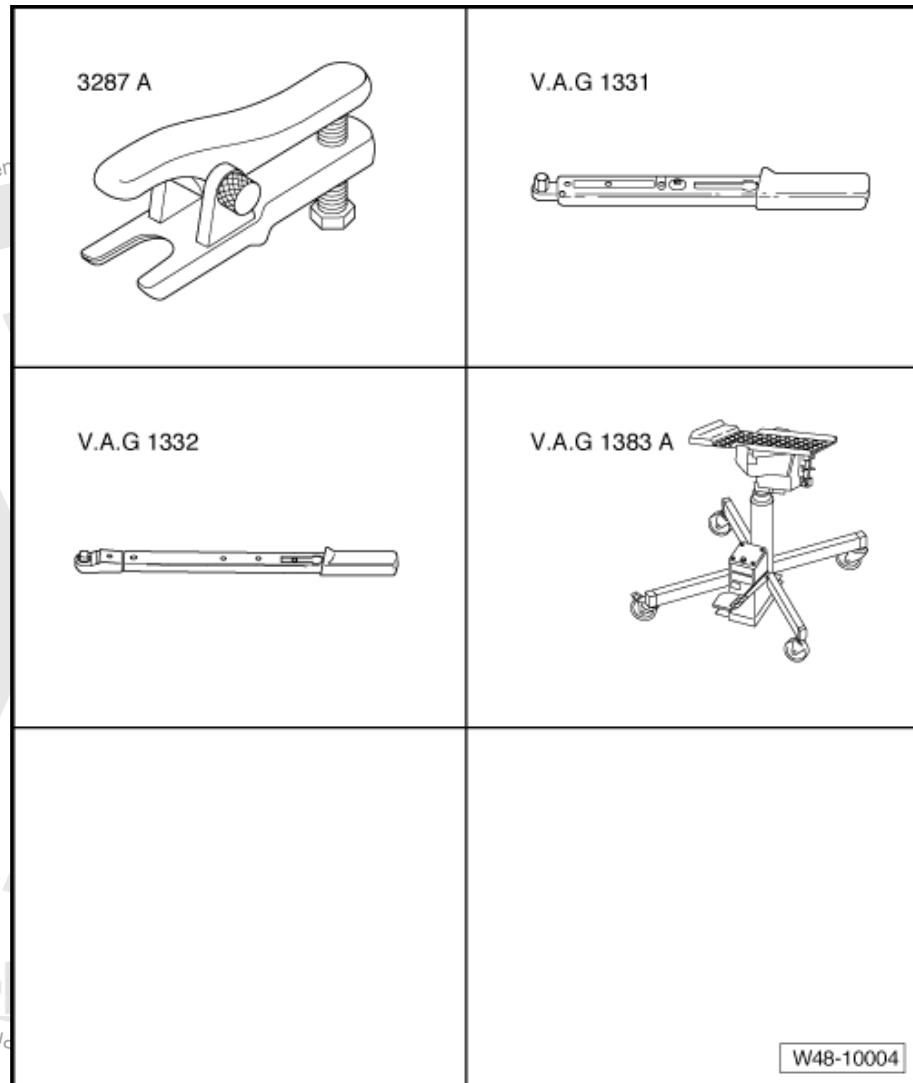
Tightening specification, pendulum support to the transmission

Bolt	Tightening Specification
M10 x 35 ◆ Use a new bolt	50 Nm + 90° additional turn
M10 x 75 ◆ Use a new bolt	50 Nm + 90° additional turn



4.4 Steering Gear, Removing and Installing, RHD - Not for USA/CDN Market

Special tools and workshop equipment required



- ◆ Torque Wrench, 6-50Nm -VAG 1331A-
- ◆ Torque Wrench, 40-200Nm -V.A.G 1332A-
- ◆ Engine and Gearbox Jack -VAS 6931-
- ◆ Puller - Ball Joint -3287 A-

Removing



Note

Correct any faults stored in the DTC memory before replacing the steering gear using the ⇒ Vehicle diagnostic tester.

- Connect the ⇒ Vehicle diagnostic tester and start “Guided Fault Finding”.

Follow the instructions on the screen.

- Turn the steering wheel in the straight position and remove the ignition key so that the steering wheel lock engages.

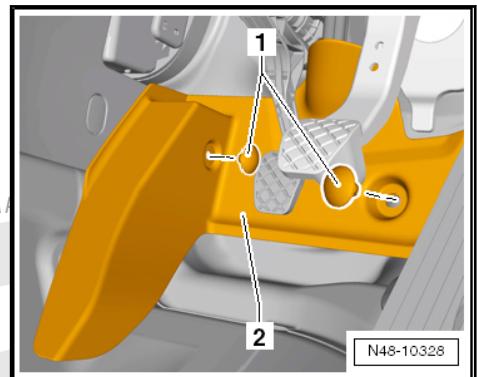


Vehicles with "Keyless Access" keyless locking and starting system

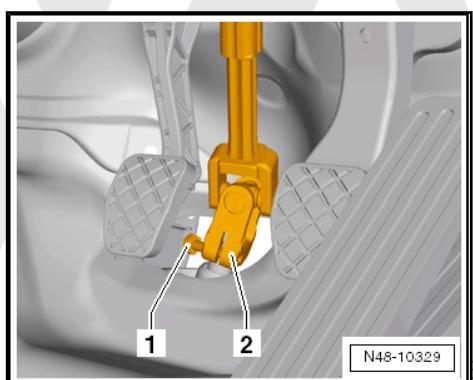
- Switch the ignition off and open the driver door so the steering wheel lock engages.

Continuation for all vehicles

- Disconnect the battery. Refer to ⇒ Rep. Gr. 27; Battery; Battery, Disconnecting and Connecting.
- Remove the footwell trim -2-, unscrew the nuts -1- to do so.



- Remove the bolt -1- and remove the universal joint -2- from the steering gear.



Caution

If the universal joint is separated from the steering gear, the following work cannot be performed:

- ◆ *Switching on the ignition*
- ◆ *Turning the steering gear*
- ◆ *Turning the steering column.*

These points must be observed since performing these actions could cause irreparable damage.

- Remove the front wheels.
- Loosen the nut of the tie rod end, but do not remove yet.

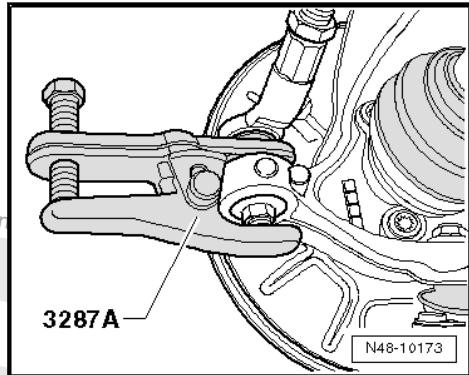


Caution

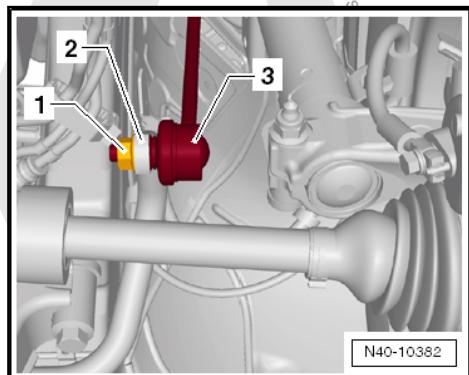
To protect the thread, screw the nut on the pin several turns.



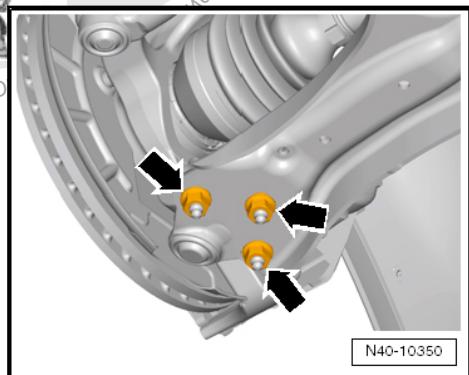
- Press off tie rod end from wheel bearing housing with Puller
- Ball Joint -3287A- and then remove nut.



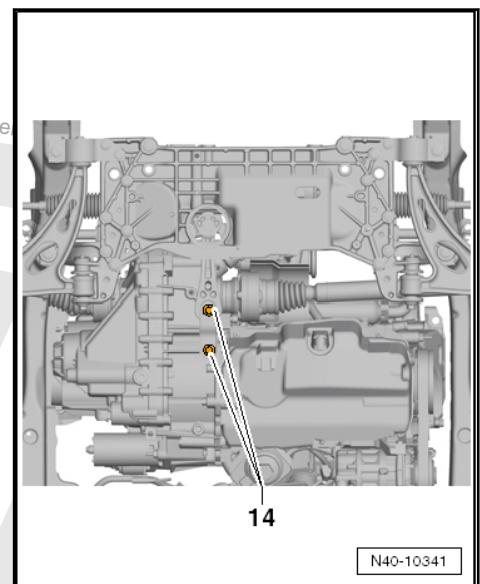
- Remove the lower noise insulation. Refer to ⇒ Rep. Gr. 50;
Overview - Noise Insulation.
- Remove the right and left nuts -1- from the coupling rods -3-.



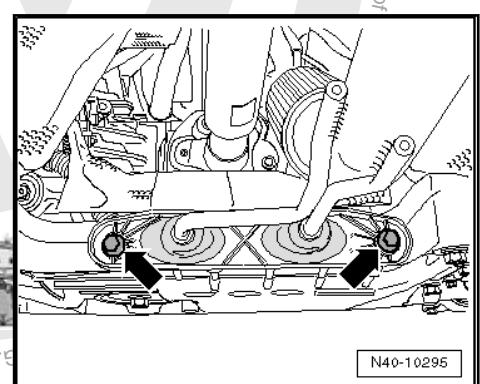
- Remove the coupling rods -3- from the stabilizer bar -2-.
- Remove the nuts -arrows-.



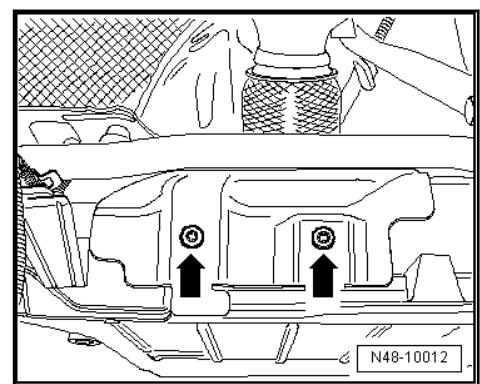
- Remove the bolts -14- and then remove the pendulum support from the transmission.



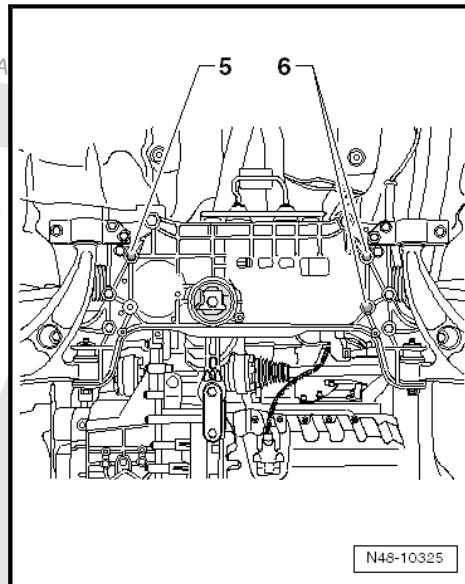
- Remove exhaust system bracket from the subframe-arrows-.



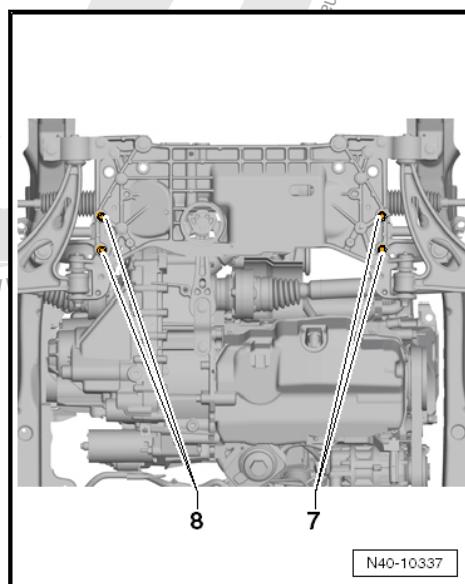
- If equipped, remove the heat shield bolts -arrows-.



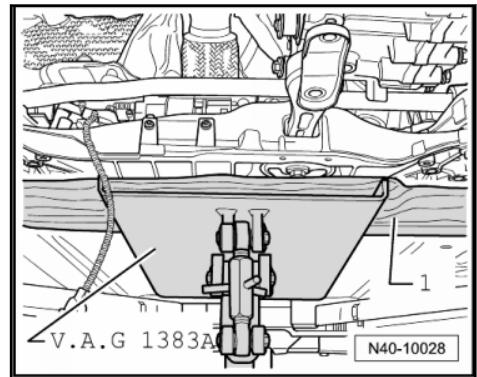
- If equipped, remove the subframe heat shield.
- Remove the bolts -5- and -6- on the steering gear.



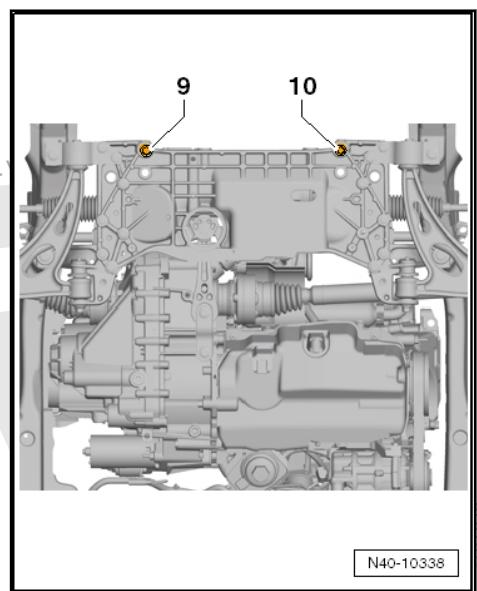
- Remove the stabilizer bar bolts -7- and -8-.



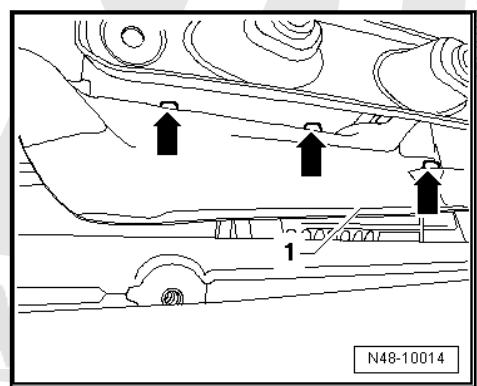
- Secure the subframe. Refer to [⇒ a3.5 nd Brackets, Securing](#), [page 16](#).
- Disconnect the connector for the service interval extension to the oil pan.
- Refer to
Place the Engine and Gearbox Jack -VAS 6931- under the subframe.



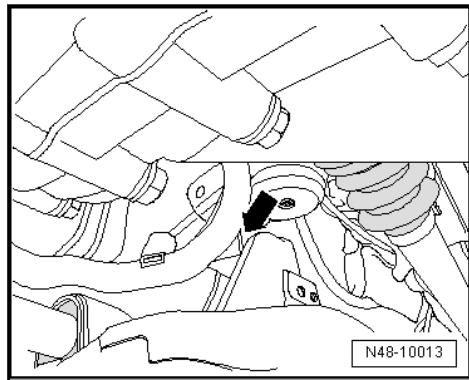
- Place, for example, a block of wood -1- between the Engine and Gearbox Jack -VAS 6931- and the subframe.
- Remove the bolts -9- and -10- and lower the subframe with the brackets slightly. Observe the wires when doing this.



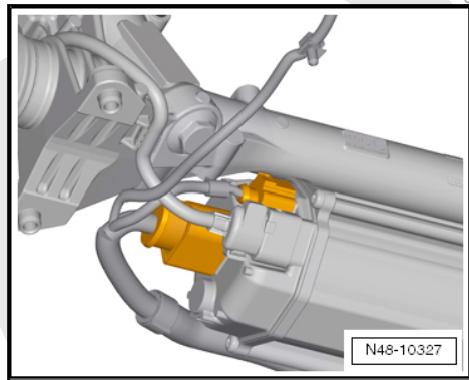
- Remove heat shield -1- above exhaust system.



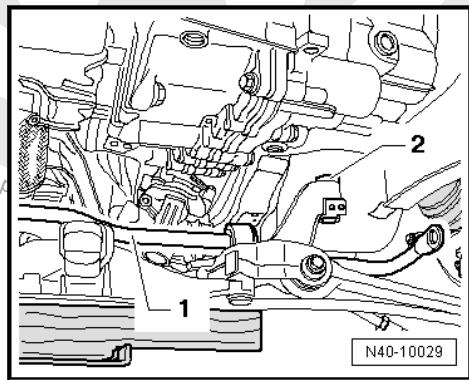
- Remove the bolts -arrows-.
- Remove the cable guide from the subframe -arrow-.



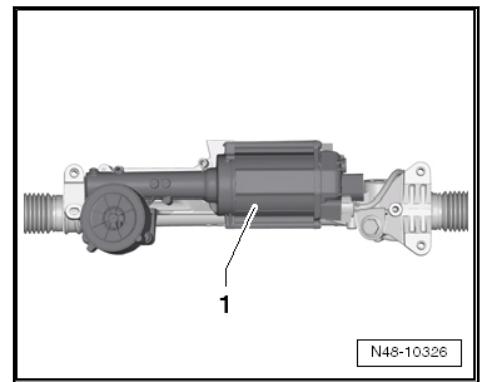
- Unclip all other cable mounting points on the steering gear.
- Disconnect the connectors from the steering gear.



- Carefully lower the subframe using the Engine and Gearbox Jack -VAS 6931-.
- Now, lift the stabilizer bar -1- toward the front, over the subframe -2- and down, while turning the stabilizer bar slightly.



- Lift down steering gear from subframe.
- Set down steering gear as depicted in the illustration.



N48-10326

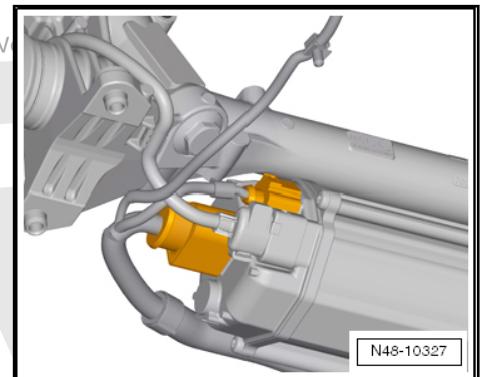
This prevents damage to the control module -1-.

Installing

Install in reverse order of removal.

The threaded sleeve must seat in subframe hole.

- Connect the connectors on the steering gear so that they click into place.



N48-10327



Note

- ◆ Coat the seal on the steering gear with lubricant such as soft soap before installing the steering gear.
- ◆ After placing the steering gear onto the universal joint, make sure that seal on steering gear makes contact on assembly plate without kinks and the opening to footwell is correctly sealed. Water leak and/or noises may be the result.
- ◆ Make sure sealing surfaces are clean.

Before fastening the bolts for subframe, position steering gear on subframe and fasten bolts for steering gear and stabilizer.

- Install the lower noise insulation. Refer to ⇒ Rep. Gr. 50; Overview - Noise Insulation.
- Bolt the universal joint to the steering gear.
- Connect the battery. Refer to ⇒ Rep. Gr. 27; Battery; Battery, Disconnecting and Connecting.
- Perform the Steering Angle Sensor -G85- basic setting using the ⇒ Vehicle diagnostic tester.

It is necessary to adapt the electromechanical steering with the ⇒ Vehicle diagnostic tester if new steering gear was installed.



- Adapt the electro-mechanical steering with the ⇒ Vehicle diagnostic tester.

Chassis

Electromechanical power steering

01 - OBD-capable system

Electro-mechanical power steering

Functions

Adapting electro-mechanical steering

Follow the instructions on the screen.

 **Note**

If the vehicle is equipped with park assist 2, then the Power Steering Control Module -J500- must be coded again ⇒ Vehicle diagnostic tester.

After installation, the position of steering wheel must be checked with a road test.

If the steering wheel is at an angle or a new steering gear was installed, the vehicle must be aligned.

- Perform a vehicle alignment. Refer to ⇒ [A8 Alignment](#), page [340](#).

Tightening Specifications

Component	Tightening Specification
Subframe to body ◆ Different versions ◆ Allocation. Refer to the ⇒ Electronic Parts Catalog (ETKA). ◆ Use new bolts.	◆ M12 x 1.5 x 100: 70 Nm + 90° ◆ M12 x 1.5 x 110: 70 Nm
Bracket to body ◆ Use new bolts.	70 Nm + 90°
Mounting bracket to body ◆ Use new bolts.	70 Nm + 90°
Stabilizer bar to subframe ◆ Use new bolts.	20 Nm + 90°
Stabilizer bar to coupling rod ◆ Use a new nut ◆ Counterhold at joint pin inner multi-point fitting	65 Nm
Control arm to cast-steel control arm ◆ Use new nuts	60 Nm
Control arm to steel panel or aluminum control arm ◆ Use new nuts	100 Nm
Shield to subframe ◆ M6 bolt is self-tapping	6 Nm
Steering gear to subframe ◆ Use new bolts.	50 Nm + 90°



Component	Tightening Specification
Universal joint to steering gear ◆ Use a new bolt	30 Nm
Shield to steering gear ◆ M6 bolt is self-tapping	6 Nm
Tie rod end to wheel bearing housing ◆ Use a new nut	20 Nm + 90°
Exhaust system bracket to subframe. Refer to ⇒ Engine Mechanical, Fuel Injection and Ignition; Rep. Gr. 26.	

Tightening specification, pendulum support to the transmission

Bolt	Tightening Specification
M10 x 35 ◆ Use a new bolt	50 Nm + 90° additional turn
M10 x 75 ◆ Use a new bolt	50 Nm + 90° additional turn



5 Electro-Mechanical Steering Gear, Servicing, RHD - Not for USA/CDN Market

⇒ [-5.1 Electromechanical Steering Gear", page 436](#)

⇒ [R5.2 Removing and Installing", page 436](#)

⇒ [R5.3 od, Removing and Installing", page 440](#)

Currently, there is no service work to be performed on steering gear.

5.1 Overview - Electromechanical Steering Gear

1 - Right Tie Rod End

- Allocation. Refer to the
⇒ Electronic Parts Catalog (ETKA).

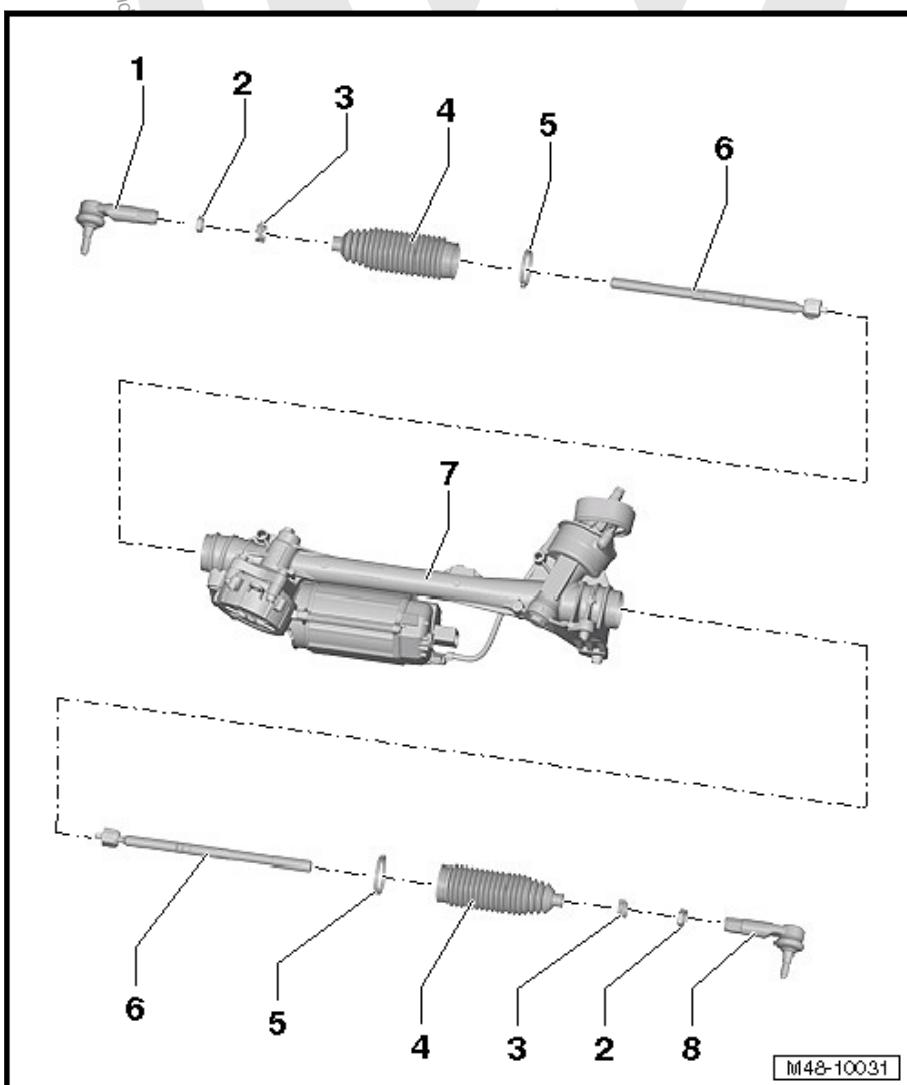
2 - Nut

- 70 Nm

3 - Clamp

4 - Boot

- Must not be twisted after toe is adjusted
- Removing and Installing. Refer to ⇒
[R5.2 Removing and Installing", page 436](#).



5 - Clamp

- Replace

6 - Tie Rod

- 100 Nm
- Removing and Installing. Refer to ⇒
[R5.3 od, Removing and Installing", page 440](#).

7 - Power Steering Gear

- Allocation. Refer to the
⇒ Electronic Parts Catalog (ETKA).
- Removing and Installing. Refer to ⇒
[G4.3 ear, Removing and Installing, LHD", page 416](#).

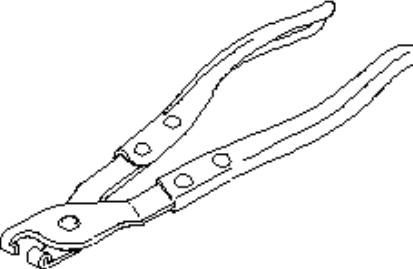
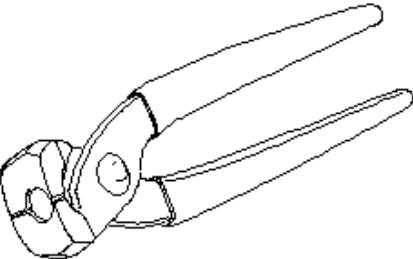
8 - Left Tie Rod End

- Allocation. Refer to the
⇒ Electronic Parts Catalog (ETKA).

5.2 Boot, Removing and Installing



Special tools and workshop equipment required

V.A.G 1275	V.A.G 1332
	
V.A.G 1332/11	VAS 6199
	

VW48-10013

- ◆ Hose Clip Pliers -V.A.G 1275A-
- ◆ Torque Wrench, 40-200Nm -V.A.G 1332A-
- ◆ Open Ring Wrench - 24mm -V.A.G 1332/11-
- ◆ Locking Pliers -VAS 6199-

Boot, Removing



Note

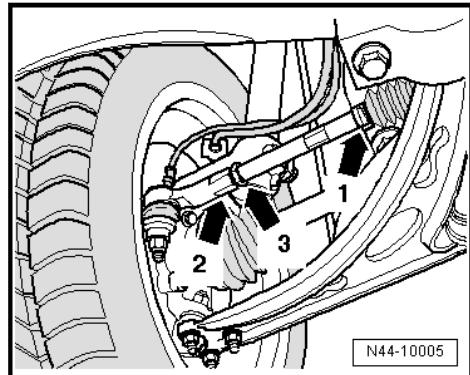
If boot is faulty, moisture and dirt penetrates into steering gear. There must be a noticeable lubricating film present on steering rack in area of splines. If grease film is not present, steering gear must be replaced. The steering gear must also be replaced if there is corrosion or steering gear is damaged or worn out.

- Turn the steering wheel into straight ahead position.
- Remove the wheel.
- Clean outside of steering gear in area of boots.



While doing this, no dirt must enter the steering gear through the faulty boot.

- Mark the position of the nut -3- on tie rod.



- Counterhold at the tie rod end -2- while loosening the nut -3-.
- Loosen the spring clamp -1- from the boot using the Hose Clip Pliers -V.A.G 1275A- and slide onto the tie rod.
- Remove clamp and pull the boot off of steering gear housing.
- Now twist tie rod out of tie rod end.
- Pull off the boot with spring clamp from tie rod.

Note

- ◆ If corrosion, damage, wear-out or first signs of soiling on steering rack can be seen, the complete steering gear must be replaced.
- ◆ If no grease film is visible on the steering rack, steering gear must also be replaced completely.

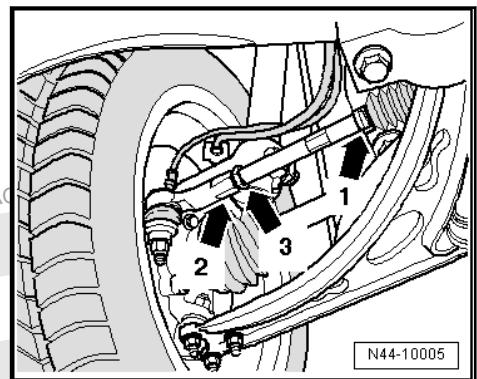
Boot, installing



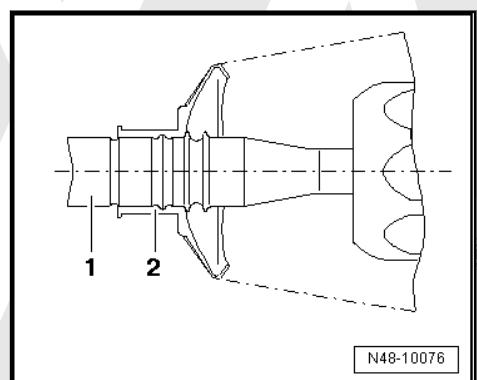
Caution

Do not lubricate the steering rack.

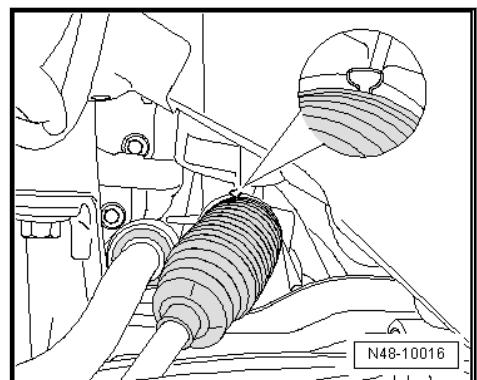
- Turn the steering wheel into straight ahead position.
- Guide new clamp and boot onto the tie rod.
- Install the tie rod up to the marking made during removal.
- Tighten the lock nut -3- to tightening specification, counterhold on tie rod end -2- while doing this.



- Slightly grease the sealing surface of the boot to the tie rod with Grease -G 052 168 A1- (from the repair kit, from Fuchs Renolit JP1619).
- Slide the boot -2- onto tie rod -1- as shown.



- Secure the spring clamp on the boot using Hose Clip Pliers -V.A.G 1275A-.
- Slightly grease the sealing surface of the boot to the steering gear housing with Grease -G 052 168 A1- (from the repair kit, from Fuchs Renolit JP1619).
- Push the boot all the way onto the steering gear housing.
- Tighten new clamp using Locking Pliers -VAS 6199- to the extent depicted in the illustration.



Further installation is performed in reverse order of the removal.

For the wheel tightening specification. Refer to [M2 Counting Tightening Specifications](#), page 315 .

After the installation the vehicle must be measured.

- Perform a vehicle alignment. Refer to [A8 Alignment](#), page 340 .



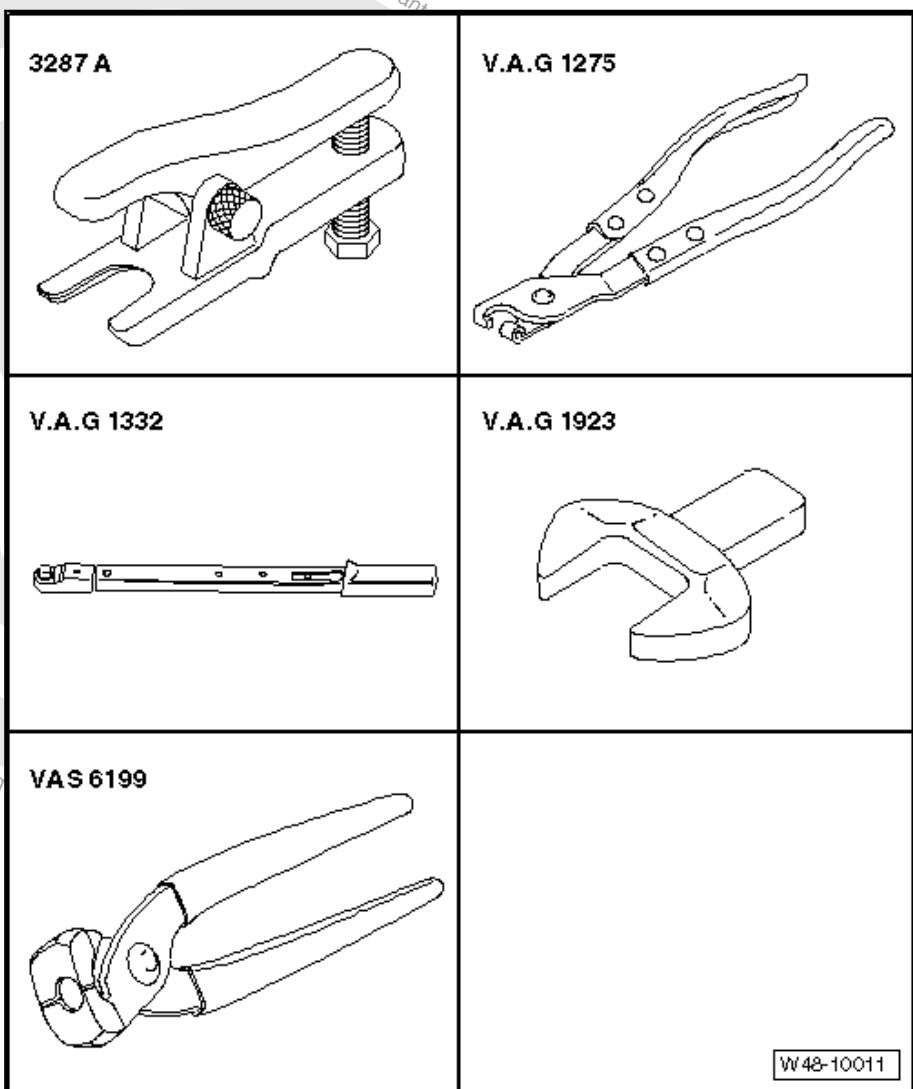
- Adapt the Steering Angle Sensor - G85- using the ⇒ Vehicle Diagnostic Tester in "Guided Fault Finding".
- Then perform steering system adaptation via ⇒ Vehicle Diagnostic Tester in "Guided Fault Finding".

Tightening Specifications

Component	Tightening Specification
Tie rod end to tie rod	70 Nm

5.3 Tie Rod, Removing and Installing

Special tools and workshop equipment required



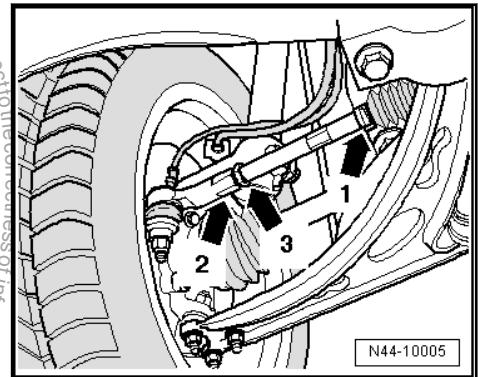
- ◆ Puller - Ball Joint -3287 A-
- ◆ Hose Clip Pliers -V.A.G 1275A-
- ◆ Torque Wrench, 40-200Nm -V.A.G 1332A-
- ◆ Torque Wrench Insert - Open Jaw -V.A.G 1923-
- ◆ Locking Pliers -VAS 6199-

W48-10011



Removing the tie rod

- Turn the steering wheel into straight ahead position.
- Clean outside of steering gear in area of boots.
- Counterhold at the tie rod end -2- while loosening the nut -3-.

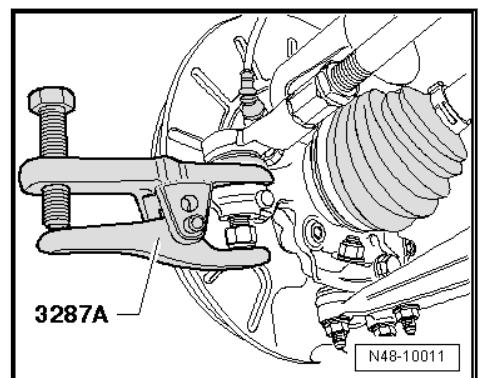


Remove the front wheel.

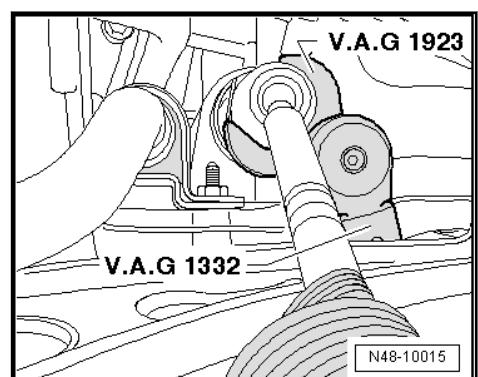
- Loosen the nut of the tie rod end, but do not remove yet.

To protect the thread, screw the nut on the pin several turns.

- Press off tie rod end from wheel bearing housing with Puller - Ball Joint 3287 A- and then remove the nut.



- Loosen spring clamp (item -1- in illustration N44-10005. Refer to [page 441](#)) using Hose Clip Pliers -V.A.G 1275A- from boot and slide onto tie rod.
- Remove clamp and pull the boot off of steering gear housing.
- Remove the tie rod from the steering gear using Torque Wrench Insert - Open Jaw -V.A.G 1923-.





Note

- ◆ If corrosion, damage, wear-out or first signs of soiling on steering rack can be seen, the complete steering gear must be replaced.
- ◆ If no grease film is visible on the steering rack, steering gear must also be replaced completely.

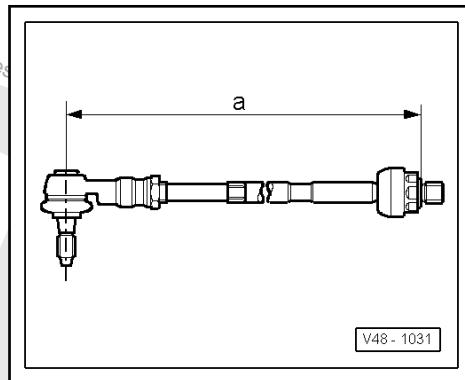
Installing the tie rod



Caution

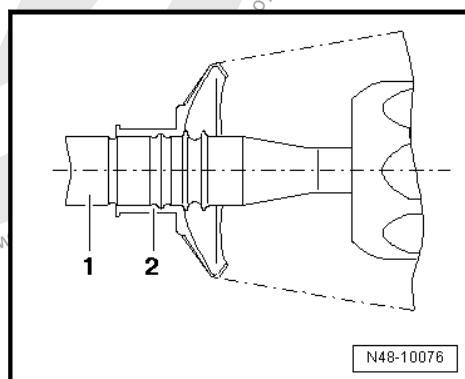
Do not lubricate the steering rack.

- Turn the steering wheel into straight ahead position.
- Guide new clamp and boot onto the tie rod.
- Twist tie rod far enough into tie rod end until dimension -a- is obtained.



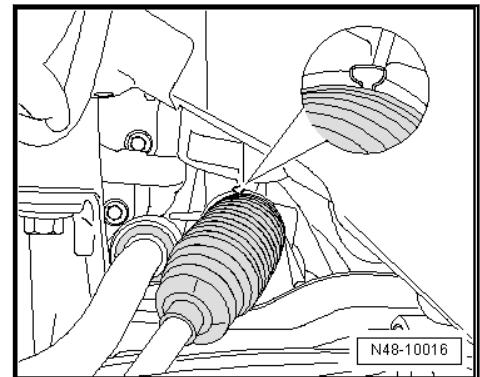
Dimension -a- = 37 ± 1 mm

- Twist tie rod into steering gear and tighten to tightening specification.
- Slightly grease the sealing surface of the boot to the tie rod with Grease -G 052 168 A1- (from the repair kit, from Fuchs Renolit JP1619).
- Position boot -2- on tie rod -1-.



- Secure the spring clamp on the boot using Hose Clip Pliers -V.A.G 1275A-.

- Slightly grease the sealing surface of the boot to the steering gear housing with Grease -G 052 168 A1- (from the repair kit, from Fuchs Renolit JP1619).
- Slide the boot onto steering gear housing until it stops.
- Tighten new clamp using Locking Pliers -VAS 6199- to the extent depicted in the illustration.



Further installation is performed in reverse order of the removal.

For the wheel tightening specification. Refer to [M2 Counting
Tightening Specifications](#), page 315 .

After the installation the vehicle must be measured.

- Perform a vehicle alignment. Refer to [A8 Alignment](#), page 340 .
- Adapt the Steering Angle Sensor - G85- using the ⇒ Vehicle Diagnostic Tester in "Guided Fault Finding" .
- Then perform steering system adaptation via ⇒ Vehicle Diagnostic Tester in "Guided Fault Finding"

Tightening Specifications

Component	Tightening Specification
Tie rod to steering rack	100 Nm
Tie rod end to tie rod	70 Nm
Tie rod end to wheel bearing housing ◆ Use a new nut	20 Nm + 90°

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Cautions & Warnings

Please read these **WARNINGS** and **CAUTIONS** before proceeding with maintenance and repair work. You must answer that you have read and you understand these **WARNINGS** and **CAUTIONS** before you will be allowed to view this information.

- If you lack the skills, tools and equipment, or a suitable workshop for any procedure described in this manual, we suggest you leave such repairs to an authorized Volkswagen retailer or other qualified shop. We especially urge you to consult an authorized Volkswagen retailer before beginning repairs on any vehicle that may still be covered wholly or in part by any of the extensive warranties issued by Volkswagen.
- Disconnect the battery negative terminal (ground strap) whenever you work on the fuel system or the electrical system. Do not smoke or work near heaters or other fire hazards. Keep an approved fire extinguisher handy.
- Volkswagen is constantly improving its vehicles and sometimes these changes, both in parts and specifications, are made applicable to earlier models. Therefore, part numbers listed in this manual are for reference only. Always check with your authorized Volkswagen retailer parts department for the latest information.
- Any time the battery has been disconnected on an automatic transmission vehicle, it will be necessary to reestablish Transmission Control Module (TCM) basic settings using the Volkswagen Factory Approved Scan Tool (ST).
- Never work under a lifted vehicle unless it is solidly supported on stands designed for the purpose. Do not support a vehicle on cinder blocks, hollow tiles or other props that may crumble under continuous load. Never work under a vehicle that is supported solely by a jack. Never work under the vehicle while the engine is running.
- For vehicles equipped with an anti-theft radio, be sure of the correct radio activation code before disconnecting the battery or removing the radio. If the wrong code is entered when the power is restored, the radio may lock up and become inoperable, even if the correct code is used in a later attempt.
- If you are going to work under a vehicle on the ground, make sure that the ground is level. Block the wheels to keep the vehicle from rolling. Disconnect the battery negative terminal (ground strap) to prevent others from starting the vehicle while you are under it.
- Do not attempt to work on your vehicle if you do not feel well. You increase the danger of injury to yourself and others if you are tired, upset or have taken medicine or any other substances that may impair you or keep you from being fully alert.
- Never run the engine unless the work area is well ventilated. Carbon monoxide (CO) kills.
- Always observe good workshop practices. Wear goggles when you operate machine tools or work with acid. Wear goggles, gloves and other protective clothing whenever the job requires working with harmful substances.
- Tie long hair behind your head. Do not wear a necktie, a scarf, loose clothing, or a necklace when you work near machine tools or running engines. If your hair, clothing, or jewelry were to get caught in the machinery, severe injury could result.
- Do not re-use any fasteners that are worn or deformed in normal use. Some fasteners are designed to be used only once and are unreliable and may fail if used a second time. This includes, but is not limited to, nuts, bolts, washers, circlips and cotter pins. Always follow the recommendations in this manual - replace these fasteners with new parts where indicated, and any other time it is deemed necessary by inspection.

Cautions & Warnings

- Illuminate the work area adequately but safely. Use a portable safety light for working inside or under the vehicle. Make sure the bulb is enclosed by a wire cage. The hot filament of an accidentally broken bulb can ignite spilled fuel or oil.
- Friction materials such as brake pads and clutch discs may contain asbestos fibers. Do not create dust by grinding, sanding, or by cleaning with compressed air. Avoid breathing asbestos fibers and asbestos dust. Breathing asbestos can cause serious diseases such as asbestosis or cancer, and may result in death.
- Finger rings should be removed so that they cannot cause electrical shorts, get caught in running machinery, or be crushed by heavy parts.
- Before starting a job, make certain that you have all the necessary tools and parts on hand. Read all the instructions thoroughly; do not attempt shortcuts. Use tools that are appropriate to the work and use only replacement parts meeting Volkswagen specifications. Makeshift tools, parts and procedures will not make good repairs.
- Catch draining fuel, oil or brake fluid in suitable containers. Do not use empty food or beverage containers that might mislead someone into drinking from them. Store flammable fluids away from fire hazards. Wipe up spills at once, but do not store the oily rags, which can ignite and burn spontaneously.
- Use pneumatic and electric tools only to loosen threaded parts and fasteners. Never use these tools to tighten fasteners, especially on light alloy parts. Always use a torque wrench to tighten fasteners to the tightening torque listed.
- Keep sparks, lighted matches, and open flame away from the top of the battery. If escaping hydrogen gas is ignited, it will ignite gas trapped in the cells and cause the battery to explode.
- Be mindful of the environment and ecology. Before you drain the crankcase, find out the proper way to dispose of the oil. Do not pour oil onto the ground, down a drain, or into a stream, pond, or lake. Consult local ordinances that govern the disposal of wastes.
- The air-conditioning (A/C) system is filled with a chemical refrigerant that is hazardous. The A/C system should be serviced only by trained automotive service technicians using approved refrigerant recovery/recycling equipment, trained in related safety precautions, and familiar with regulations governing the discharging and disposal of automotive chemical refrigerants.
- Before doing any electrical welding on vehicles equipped with anti-lock brakes (ABS), disconnect the battery negative terminal (ground strap) and the ABS control module connector.
- Do not expose any part of the A/C system to high temperatures such as open flame. Excessive heat will increase system pressure and may cause the system to burst.
- When boost-charging the battery, first remove the fuses for the Engine Control Module (ECM), the Transmission Control Module (TCM), the ABS control module, and the trip computer. In cases where one or more of these components is not separately fused, disconnect the control module connector(s).
- Some of the vehicles covered by this manual are equipped with a supplemental restraint system (SRS), that automatically deploys an airbag in the event of a frontal impact. The airbag is operated by an explosive device. Handled improperly or without adequate safeguards, it can be accidentally activated and cause serious personal injury. To guard against personal injury or airbag system failure, only trained Volkswagen Service technicians should test, disassemble or service the airbag system.

Cautions & Warnings

- Do not quick-charge the battery (for boost starting) for longer than one minute, and do not exceed 16.5 volts at the battery with the boosting cables attached. Wait at least one minute before boosting the battery a second time.
- Never use a test light to conduct electrical tests of the airbag system. The system must only be tested by trained Volkswagen Service technicians using the Volkswagen Factory Approved Scan Tool (ST) or an approved equivalent. The airbag unit must never be electrically tested while it is not installed in the vehicle.
- Some aerosol tire inflators are highly flammable. Be extremely cautious when repairing a tire that may have been inflated using an aerosol tire inflator. Keep sparks, open flame or other sources of ignition away from the tire repair area. Inflate and deflate the tire at least four times before breaking the bead from the rim. Completely remove the tire from the rim before attempting any repair.
- When driving or riding in an airbag-equipped vehicle, never hold test equipment in your hands or lap while the vehicle is in motion. Objects between you and the airbag can increase the risk of injury in an accident.

I have read and I understand these Cautions and Warnings.

